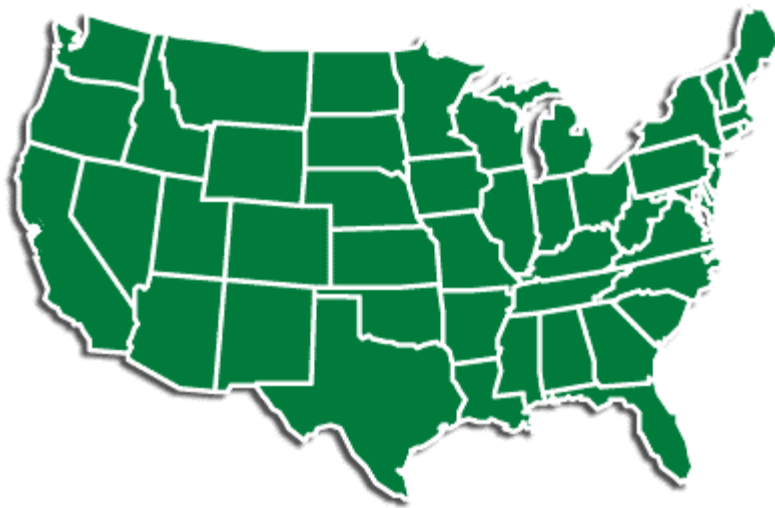


Nurses and Environmental Health: Success Through Action

Illustrations From Across the Nation



January 2002

**U.S. DEPARTMENT OF HEALTH
AND HUMAN SERVICES**
Agency for Toxic Substances and Disease Registry

N•E•E•T•F
The National Environmental Education & Training Foundation

-DRAFT-

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The National Environmental Education & Training Foundation
1707 H Street, N.W. Suite 900
Washington, DC 20006

Telephone 202-833-2933
Fax 202-261-6464
Web www.neetf.org

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“No amount of medical knowledge will lessen the accountability for nurses to do what nurses do; that is, manage the environment to promote positive life processes.”

¾Florence Nightingale

“Environmental health comprises those aspects of human health, including quality of life, that are determined by interactions with physical, chemical, biological and social factors in the environment. It also refers to the theory and practice of assessing, correcting, controlling and preventing those factors in the environment that may adversely affect the health of present and future generations.”

¾Pew Environmental Health Commission

(as adapted from the World Health Organization’s 1993 definition of environmental health)

The National Environmental Education & Training Foundation (NEETF), chartered by the U.S. Congress in 1990, focuses on environmental learning as a solution to critical national challenges in health care, education, business and natural resources management. In its mission to support environmental education, NEETF initiates programs and public and private partnerships that will result in an environmentally knowledgeable public, environmentally competent professionals, and environmentally capable leaders and policy makers.

The Health & Environment Programs at NEETF are designed to integrate environmental health into health care provider education and practice settings (e.g., medical and nursing schools, continuing education programs, and private health care organizations) and improve environmental health conditions in the United States, with an emphasis on children's environment. Through the development of national agendas, community and demonstration projects, curriculum integration, medical certification requirements, and strategic partnerships, NEETF is a catalyst for improving environmental health education.

The Agency for Toxic Substances and Disease Registry (ATSDR), a part of the U.S. Department of Health and Human Services, is the principal federal public health agency involved with hazardous waste issues. The mission of ATSDR is to serve the public by using the best science, taking responsive public health actions, and providing trusted health information to prevent harmful exposures and disease related to toxic substances.

Some of those mandated functions of ATSDR's Division of Health Education and Promotion (DHEP) include education, training, and development and dissemination of information about hazardous substances. As a part of these functions, DHEP is leading the Nationwide Environmental Health Nursing Initiative to inform and educate nurses on issues related to the environment and health. For more information, visit the ATSDR Web site (www.atsdr.cdc.gov).

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Foreword

Despite improvements in our environment over the last 25 years, many human health problems are still linked to environmental pollution and environmental factors. Members of the public trust their health care providers to provide information, treatment, and guidance on an entire spectrum of health complaints and concerns, yet very few health professionals receive environmental health training.

Nurses have undertaken initiatives to develop an environmental health component in their professional practices. By assessing and understanding the environments in which their patients live, work, and play, nurses are providing better health care to their patients. Nurses with environmental health training are closing the information gap by educating school personnel, parents, and children on asthma triggers, pesticides, hazardous wastes, and other environmental exposures. They have conducted environmental exposure health histories and educated community members about exposures to environmental health hazards. As part of this effort, they also have developed effective risk communication messages for communities concerned with environmental hazards and health outcomes.

Individuals and families, as well as communities, look to nurses for guidance on health risks, particularly those associated with potential hazards at home or at work. More than 2.7 million registered nurses represent the nation's largest professional health sector. Nurses possess diverse skills and are often the most trusted, visible, and active health professionals working where people live, work, and play. They are a key resource to identify, prevent, and address health risks related to the environment and are providing considerable support for these activities.

The genesis of this publication stems from an event held in Baltimore, Maryland, in November 1999: the *Strategic Planning Workshop on the Nursing Workforce and Environmental Health*. A small group of nursing professionals from around the country attended this workshop, including participants from a working group originally convened by the Agency for Toxic Substances and Disease Registry (ATSDR) in September that same year. That gathering of nursing leaders also included members of the National Advisory Board for the Faculty

Development in Environmental Health project at the University of Maryland School of Nursing, and nurses identified by the National Environmental Education & Training Foundation (NEETF). Funding for the workshop was generously provided by the Centers for Disease Control and Prevention (CDC) with added support from ATSDR.

Partnerships with academic institutions, practice settings, professional associations, government agencies, and nonprofit organizations strengthen and support the nursing profession in its efforts to address environmental impacts on human health. This publication provides a snapshot of how nursing professionals can successfully carry out environmental health activities. There are many environmental health nursing projects both planned and under way—far too many to include in this publication. This publication, however, presents examples of effective initiatives that can serve as models for other activities and projects. It is intended as a source book that will garner additional support for advancing environmental health activities toward the goal of improvement of health in the United States.

As this national change in nursing practice, research, and education gathers momentum, we hope that these action models will inspire and catalyze new environmental health promotional activities.

Kevin J. Coyle, President

National Environmental Education & Training Foundation

Washington, D.C.

Henry Falk, MD, MPH, Assistant Administrator

Agency for Toxic Substances and Disease Registry

Atlanta, Georgia

Introduction

Since Florence Nightingale's time, the environment has been viewed as a major domain of nursing concern, yet few nurses and other health care providers receive any formal environmental health education or training. We breathe the air, drink the water, and, in today's society, are potentially exposed to many chemicals at work, at home, and in our communities. The environment is an element that interplays with human health and demands the attention and understanding of health care providers, especially nurses.

The landmark 1995 Institute of Medicine (IOM) report, *Nursing, Health, and the Environment: Strengthening the Relationship to Improve the Public's Health*, called for basic environmental competencies for registered nurses. These competencies include basic knowledge and concepts; assessment and referral; advocacy, ethics, and risk communication; and legislation and regulation. Since the report was issued, nursing professionals have initiated programs in practice, education, and research to bring the IOM recommendations to fruition. Many national and grassroots efforts have already taken shape. *Nurses and Environmental Health: Success Through Action, Illustrations From Across the Nation* presents examples of those emerging efforts.

This publication is divided into four major areas: environmental health in nursing practice; environmental health in nursing education; environmental health in nursing research; and federal initiatives in environmental health in nursing. The illustrations presented in the area of nursing practice focus on community outreach to improve public health. Through these stories we see nursing students and professionals affecting their own communities. Projects range from a "zero mercury tolerance" campaign by labor nurses to students providing environmental assessments and assistance in the aftermath of natural disasters.

The illustrations presented in the area of nursing education range from development of focused programs and extensive curricula within baccalaureate nursing programs to interactive education tools and experiential learning. The examples include projects focused on local environmental issues and at-risk populations, assessments, interdisciplinary collaboration, and environmental health advocacy.

Nursing research in environmental health is a growing area of interest and importance. The examples presented in this publication encompass community surveys of environmental

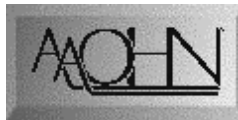
health awareness; examination of the environmental exposures of housekeepers, janitors, and building custodians; and environmental factors impacting high-risk populations.

The illustrations presented in the area of federal initiatives include training for community-based education; electronic forums; continuing education curricula and conferences; and development of regulations and standards for nursing practice. These programs incorporate alliances with nonprofit and professional organizations nationwide through which environmental efforts are extended.

Individually, nurses' stories present creative steps for revitalizing the environment as one of the major domains within the scope of nursing education, practice, and research. These stories illustrate the cross-functional types of initiatives that are increasing the capacity of nurses to address environmental impacts on human health.

Environmental Health in Nursing Practice:

Community Outreach To Improve Public Health



Vermont Department of Health

“Nurses play an increasingly critical role in our changing health care system.”
¾Administrator Claude Earl Fox, MD, MPH, Health Resources and Services
Administration, U.S. Department of Health and Human Services

Providing Hands-On Experience and Academic Opportunity

East Carolina University, School of Nursing Greenville, North Carolina

Nursing faculty and students at East Carolina University (ECU) are actively integrating environmental health content into their research, practice, and education efforts. The university partners with North Carolina State University, Raleigh, and North Carolina A&T State University, Greensboro, to form a statewide Agromedicine Program. Program faculty members are currently working to channel financial support derived from tobacco settlements into environmental health and nursing research. Additionally, ECU nursing faculty are researching lead exposures in rural areas and occupational injuries related to farming practices and environmental hazards.

In 1999, Hurricane Floyd provided ECU Nursing faculty and students with many environmental health learning opportunities. In its aftermath, undergraduate nursing students without prior field experience assisted with recovery efforts and received detailed education on how to conduct home environment assessments. They also learned the basics of the community health clinic practice. In collaboration with local health departments, students assisted ravaged communities by conducting door-to-door assessments, giving particular attention to the drinking water quality, sewage disposal, solid waste disposal, and air quality conditions.

Through her leadership as president of the Council of Collegiate Education for Nursing, of the Southern Region Educational Board (SREB), ECU School of Nursing Dean Phyllis Horns, RN, DSN, encourages the inclusion of environmental health content at all levels of nursing curricula. The council recently partnered with the School of Nursing at the University of Maryland, Baltimore (page 27), to provide faculty development workshops for SREB nurse educators across 16 states (Alabama, Arkansas, Delaware, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia). These workshops, supported by a grant from the W.K. Kellogg Foundation and the National Environmental Education & Training Foundation, have increased educator awareness of environmental health issues and helped faculty incorporate environmental health concepts into the nursing curriculum.

* * *

Phyllis Horns, RN, DSN
Dean and Professor
School of Nursing
East Carolina University
136 Rivers Building, Room 133
Greenville, NC 27858-4353
Tel: 252-328-6099
Fax: 252-328-4300
E-mail: hornsp@mail.ecu.edu
Web: 150.216.11.101/newnet

Introducing Nursing Students to Environmental Health Problems: Assessment, Study, and Evaluation

**Worcester State College
Worcester, Massachusetts**

The curriculum for the undergraduate nursing program at Worcester State College is built on the conceptual framework described by Florence Nightingale, nursing's first environmental theorist. In her *Notes on Nursing*, Nightingale identifies the canons of nursing care: pure air, clean water, warmth, noise control, light, and waste management. She writes that the nurse should monitor and improve these environmental elements to promote health.

Each clinical and nonclinical course at Worcester State College contains one or more of the general environmental health competencies identified by the Institute of Medicine (IOM) report, *Nursing, Health, and the Environment: Strengthening the Relationship To Improve the Public's Health*. These competencies include basic knowledge and concepts; assessment and referral; advocacy, ethics, and risk communication; and legislation and regulation.

In third-year nursing studies, students have the opportunity to synthesize and apply previous learning in environmental health through a community health assessment project. This project goes beyond traditional community health assessment and gives students the opportunity to examine major dimensions of a community. For example, students collect data about waste storage and treatment activities, government activity (e.g., Department of Energy/Department of Defense ordnance and military equipment maintenance), mining and manufacturing activity, pesticide/herbicide use, heavy traffic areas, housing stock age, airports, and railroad yards in a specific community. Data are also collected about community water supplies, air quality, Superfund sites, and sites identified by the Massachusetts Department of Environmental Protection. Students are required to complete a site assessment at a source of environmental pollution that includes identification of regulatory status, ambient air quality, food chain use, soil and surface water use near the site, and physical hazards on-site or nearby. Students use epidemiological methods to examine a variety of other data sources including vital statistics, local and state health departments, and community agencies as well as conduct windshield surveys and interviews with key community informants.

Students formulate a community health diagnosis that identifies a health risk, an affected community, an etiologic or causal statement, and evidence/support for the diagnosis. At the end of the project, students write a report and submit it to the town. Some of the more successful projects have been presented at town board meetings. Some have caused town or community group reaction. For example, students linked respiratory illnesses and complaints of headaches to mold growing in a town building, which had experienced flooding. Student activity attracted attention to the issue and roused community interest, which was followed by remediation.

Students found this work to be very demanding, but the evaluation of the project itself has been overwhelmingly positive. Students recognized that the project helped them synthesize what they learned in the abstract and apply it in a way that became meaningful. Nursing faculty recognize that this practical experience helps students, no matter their specialty or practice setting, to understand how insidious, ubiquitous, and poorly understood environmental health hazards are and how they can address them.

* * *

Stephanie Chalupka, EdD, RNCS, CETN
Former Faculty Member
Worcester State College
88 Merriam Road
Grafton, MA 01519
Tel: 508-839-2139
E-mail: chalupka@msn.com
Web: www.worc.mass.edu/nursing/default.htm

Building Capacity for Environmental Health Through Partnerships and Nurse Training

The American Association of Occupational Health Nurses Atlanta, Georgia

In 1996 the American Association of Occupational Health Nurses, Inc. (AAOHN), was awarded a 3-year cooperative agreement from the Agency for Toxic Substances and Disease Registry (ATSDR) titled “Environmental Health Education for Health Professionals and Communities.” The project supported ATSDR’s Nationwide Environmental Health Nursing Initiative (page 51). The project used a train-the-trainer model for providing continuing education. It targeted educators and front-line nurses who practice in areas including public health, school health, and community health and who serve constituencies impacted by hazardous waste sites. The nurses, in turn, provide environmental health education for identified community groups, school children, student nurses, and professional groups.

ATSDR identified priority sites where the project would be implemented while AAOHN developed and provided program focus on the specific site contaminants and the assessed educational needs of the nurses and affected communities. The two ATSDR-selected sites were Chattanooga Creek in Chattanooga, Tennessee, and Kelly Air Force Base (Kelly AFB) in San Antonio, Texas. Chattanooga Creek was identified as a public health hazard because of chemical contaminants in its sediments, surface water, and fish. Historically, a large number of industries, including those engaged in the manufacture of coke, organic chemicals, and brick discharged untreated industrial waste into the creek. In addition, the city of Chattanooga and private citizens used the creek as a dumping ground for municipal waste. Kelly AFB generated waste solvents, chrome and electroplating sludges, and several other hazardous chemicals during its base operations. Potential hazardous waste contamination has also been associated with landfills, chemical evaporation pits, jet fuel spills, and unregulated waste processes.

The one-day intensive train-the-trainer workshops at each site attracted nurses and other health care professionals. Workshop topics included the role of nurses in environmental health, the toxicology of the specific site contaminants and their potential effects on human health, exposure pathways, vulnerable populations, taking exposure histories, and health risk communication. One of the project outputs was a database of environmental health resources,

available under the heading Environmental Health Resources on the AAOHN Web site (www.aaohn.org).

AAOHN was awarded a second cooperative agreement, which extends through 2004. This project, "Program to Build Capacity to Conduct Environmental Health Education Activities," has two goals: to support ATSDR's site-specific environmental health mandate and to increase AAOHN's capacity to provide environmental health education to its general membership. As part of this cooperative agreement, AAOHN will work with the Oak Ridge Institute for Science and Education to perform a multicounty needs assessment for a Department of Energy site near the Savannah River.

* * *

Ann Cox, CAE
Executive Director
AAOHN
2920 Brandywine Road, Suite 100
Atlanta, GA 30341-5539
Tel: 770-455-7757
Fax: 770-455-7271
E-mail: ann@aaohn.org
Web: www.aaohn.org

Involving Communities in Environmental Health Nursing

Department of Health and Environmental Control Columbia, South Carolina

The South Carolina Department of Health and Environmental Control (SCDHEC) has operated since 1878 as the state's official public health agency. The department's traditional responsibilities have included epidemiology; communicable disease prevention and control; chronic disease prevention and detection; maternal and child health programs; home care and environmental health (once known as environmental sanitation) activities. The environmental health activities ensure safety in food service, milk supply, vector control, individual drinking wells, and sewage disposal systems. In 1973, the department undertook state and U.S. Environmental Protection Agency (EPA)-delegated environmental responsibility for air and water quality plus land and waste management. Coastal management was added to the department's responsibilities during the 1990s.

SCDHEC has a network of multicounty administrative units that manage field operations in environmental programs and local health services, management, and consultation. In 1993, a seasoned public health nurse began developing the role of and serving as Director of Risk Communication and Community Liaison within Environmental Quality Control. The position connects concerned members of the public to staff within the department (environmental scientists, environmental engineers, epidemiologists, toxicologists, media relations, and local health and environmental staff).

The work of the community liaison often involves

- Visits to homes, community groups, industries, and contaminated sites
- Planning, arranging, and moderating public forums, and other strategies to inform and involve the public in environmental issues
- Problem-solving with staff to provide comprehensive, integrated responses to environmental incidents and community concerns
- Communication through letters, telephone, e-mail, and in individual and group meetings
- Identifying and advocating procedural and policy changes to become more inclusive and responsive to the public

- Building local liaison capacity through the development of a cadre of local and district staff, including public health nurses.

The community liaison conducts the following environmental health education activities:

- Lecturing and serving as adjunct faculty in schools of nursing and public health
- Helping nursing students to develop environmental projects as part of their undergraduate and graduate community health courses
- Hosting student interns and using graduate assistants in environmental work
- Serving on university advisory committees and working on special projects to increase environmental content in nursing
- Collaborating with and facilitating university-based research projects
- Writing and publishing, and making intrastate presentations about how nursing professionals can work in the environmental health field
- Bringing a public health nursing perspective to environmental discussions in national committees and organizations.

* * *

Lillian Mood, RN, MPH, FAAN
Community Liaison
SCDHEC
2600 Bull Street
Columbia, SC 29201
Tel: 803-898-3929
Fax: 803-898-3931
E-mail: moodlh@columb30.dhec.state.sc.us
Web: www.state.sc.us/dhec

Extending Health Care Education to Children To Reach an At-Risk Community

**Department of Nursing, College of Allied Health Professions
Temple University
Philadelphia, Pennsylvania**

The service arm of Temple University's Department of Nursing, called the Temple Health Connection (THC), provides a community-based, academic nursing practice that emphasizes education, evidence-based practice, and practice-based research. The Department of Nursing supports constituent-driven education, service, and research, which allow community needs to direct the Department of Nursing's health care services.

Temple University and THC sit within North Philadelphia, one of the city's highest risk areas for lead poisoning due to a high concentration of old, deteriorating houses that contain many layers of lead paint. Lead dust, a by-product of the old paint, has caused a virtual epidemic of lead poisoning in the community. Forty-five percent of all of North Philadelphia's children are estimated to suffer from some degree of lead exposure. Medical professionals estimate that 90% of children who live in low-value housing in North Philadelphia have elevated lead levels in their blood.

THC decided to reach out to families in need of information to help protect their children at risk because of this insidious environmental problem. The Philadelphia Health Department's Lead Poisoning Prevention Program extended funds to THC for a 6-year period to use in community education. The faculty adopted a multitiered, multigenerational approach, first targeting children, then their parents and grandparents.

The program to educate families of children-at-risk with low-level lead poisoning began in June 1996 with funding from the National Institute of Environmental Health Sciences (NIEHS) to implement *Lead Awareness: North Philly Style*. The project sought to test community-developed, community-based prevention strategies, in particular, those that intended to change behaviors that contribute to increased exposures from lead. The National Institute for Nursing Research at the National Institutes of Health also supported this project.

Nurses and their community partners visited children, ages 3 through 12, in after-school programs to teach them songs, chants, and cheers about how to outsmart lead dust:

Wash hands!

Wipe feet!

Don't bring that lead from off the street!

They created The Lead Detective, a neighborhood hero perpetually in search of deadly lead dust. The Lead Detective, in trench coat, hat, and mustache and with magnifying glass in hand, taught children to rid their homes of lead dust, to eat foods high in calcium and vitamin C, never to chew on or eat crayons, and to make sure that crayons they used were made in the United States. Songs, dances, t-shirts, and puppet shows reinforced these messages to the children of what to avoid, what to do, and what to tell their parents.

Parents were invited to block parties and community dinners, organized by neighborhood captains, to receive the lead intervention messages their children were given after school. Parents received buckets of cleaning supplies and were instructed to thoroughly clean windowsills and doorways, where lead dust normally settles.

Nursing community partners visited grandparents at senior centers to advise them that their grandchildren were at risk. They taught the elderly how they could help protect their grandchildren by insisting on frequent hand washing, feet wiping, and supervising play to ensure that nonedible play materials are not ingested.

A summer brownfield planting project in North Philadelphia's vacant lots encouraged children to develop "green thumbs" in an effort to eliminate areas where lead dust could easily settle and then be tracked into homes. Local Girl Scout troops pitched in to dig holes and cultivate green areas. The U.S. Environmental Protection Agency (EPA) funded this youth-oriented growing project with Morris Arboretum of the University of Pennsylvania. As part of this project, the environmental health curriculum provided to Temple's generic baccalaureate nursing students was critiqued, enhanced, and shared with all baccalaureate nursing education programs in Pennsylvania.

This lead poisoning intervention project reached numerous children, families, and adults and was a success because Temple's Nursing Department involved community members and grassroots agencies serving the neighborhoods: Norris Homes and Apartments, Fairhill Apartments, the Village of the Arts and Humanities, Neighborhood Action Bureau, the

Philadelphia Parent Child Center, and the Lead Poisoning Prevention Program of the Philadelphia Health Department. Best of all, according to THC Director of Community and Academic Outreach Rita Lourie, the kids involved felt they developed new skills they could share with their community and they became role models for their less informed neighbors.

Other health outreach efforts include a program in which Temple University baccalaureate nurse candidates teach the American Lung Association's Open Airways For Schools program to elementary school pupils in North Philadelphia. Student nurses also offer community-based asthma education programs for neighborhood children and their caregivers through the auspices of the Temple University Children's Medical Center.

* * *

Rita Lourie, MSN, RN
Director of Academic and Community Outreach
Department of Nursing, CAHP
Temple University
3307 North Broad Street 602-00
Philadelphia, PA 19140
Tel: 215-707-4872
Fax: 215-707-4594
E-mail: rlourie@temple.edu, rlourie1@aol.com
Web: www.temple.edu/CAHP

Reaching Out to Community Members With Public Health Messages and Mentoring Nursing Students in Environmental Health Skills

Fletcher Allen Health Care Burlington, Vermont

Fletcher Allen Health Care, a private, publicly supported, nonprofit teaching hospital and physician network, serves more than 850,000 people in Vermont and northeastern New York and strives to unite its teaching and research missions.

The Community Health Improvement Division of Fletcher Allen Health Care focuses on outreach efforts aimed at Vermonters of all ages to encourage them to take an active role in improvement of their personal health. Outreach efforts include a myriad of topics such as fire and fall prevention, smoking cessation, stress reduction, exercise, and environmental health awareness. Its Mentoring in Environmental Health Program is designed to provide nursing students with basic information on environmental health, project assistance, and learning opportunities related to institutional waste management, pollution prevention, hazard reduction, children's environmental health, and community health leadership. This program seeks to develop leadership skills for a future nursing workforce that is knowledgeable and competent in issues related to environmental health, pollution prevention, and institutional environmental accountability.

In her role as Environmental Health Coordinator, Adjunct Associate Professor Hollie Shaner, RN, MS, works one-on-one with undergraduate nurses and master's degree candidates on projects related to environmental health. Various mentoring relationships have produced a guidebook on children's environmental health, enhanced Web research skills for student nurses, and a renewed appreciation for Florence Nightingale's environmental theory.

The Children's Environmental Health Initiative focuses on the needs of all children in the community who are vulnerable to environmental exposures. The program provides technical assistance, advocacy, and information to those who care for children, such as parents, childcare providers, and pediatric office nurses. Outreach efforts are also integrated into a variety of nontraditional settings such as Elderfest, which reaches out to grandparents and elderly family members to educate them about making their homes safe for grandchildren. Introductory presentations on children's environmental health topics are given to medical students, pediatric

residents, and nursing students. The initiative also reaches out to students in middle and high schools with environmental health messages.

A compact-sized electric car serves as Fletcher Allen’s “mascot” illustrating the linkages among transportation, air pollution, and respiratory health. Community members of all ages are charmed by the novelty of the car that travels to schools, senior centers, community fairs, and festivals with messages as diverse as using sun block at the beach to the dangers of air pollution. Students with good driving records are sometimes asked to log mileage in the electric car and compute how many pounds of air pollution they mitigated by not burning gasoline. Senior citizens ride in the car and receive messages about grandchild-safe homes and gardens.

Another aspect of the Environmental Health Coordinator role is to be “at the table” in the community on a number of committees, as an advocate for public health. Examples of committee appointments include the Vermont Governor's Advisory committee on mercury pollution (www.mercvt.org), the Burlington Mayor's Council on Climate Protection, and the governing board of the Vermont Electric Vehicle project (www.vermont.org). Having a nurse with an environmental health background serve on these committees helps ensure that the focus and direction of policy, planning, and legislation will include public health priorities.

* * *

Hollie Shaner, RN, MS
Environmental Health Coordinator
Fletcher Allen Health Care
111 Colchester Avenue
Burlington, VT 05401
Tel: 802-656-2399
E-mail: hshaner@aol.com
Web: www.fahc.org

Campaigning for Environmentally Responsible Health Care Industry Practices

Health Care Without Harm Falls Church, Virginia

Health Care Without Harm is a collaborative campaign for environmentally responsible health care. More than 280 organizations in 26 countries have joined this effort to transform the health care industry into a network of fully responsible health care providers. Led by nurses, this campaign calls for greatly reducing or eliminating source pollution from hospitals, clinics, and other health care providers with continued, uncompromised safety and health care services.

Health Care Without Harm accomplishes its mission by

- Promoting comprehensive pollution prevention practices
- Supporting the development and use of environmentally safe materials, technology, and products
- Educating and informing health care institutions, providers, workers, consumers, and all affected constituencies about the environmental and public health impacts of the health care industry and recommending solutions.

Nursing professionals lead every aspect of the Health Care Without Harm campaign, whose goals include

- An ecologically sustainable health care system gained through consensus with a wide range of constituencies
- The elimination of nonessential incineration of medical waste and the promotion of safe materials in treatment practices
- Phased-out use of polyvinyl chloride (PVC) and persistent toxic chemicals and momentum built for a broader PVC phase-out campaign
- Phased-out use of mercury in the health care industry
- Health-based standards for medical waste management in compliance with the public's right to know about chemicals used in the health care industry
- An effective collaboration and communication structure among campaign allies.

Nursing organizations, including the American Nurses Association, the Intravenous Nursing Society, the Oncology Nursing Society, the International Congress of Nurses, as well as 10 state nurses associations (California, Massachusetts, Michigan, Montana, North Carolina, New Hampshire, New York, Ohio, South Carolina, Vermont), are key members of Health Care Without Harm. Nurses linked to the campaign exhibit leadership and take direct action to make their workplaces more environmentally responsible. For example, a group of labor and delivery room nurses in Worcester, Massachusetts, concerned with the toxic effects of mercury, convinced their hospital to stop sending new parents home with a mercury fever thermometer. Instead, they convinced their waste hauler to buy nonmercury thermometers for new parents. They eliminated a mercury source in their environment and sent a strong message to a new population that mercury deserves zero tolerance.

Nurses in Sacramento, California, encouraged their hospitals to minimize waste impact through environmentally sound purchasing, waste segregation, active recycling programs, and disposal through nonincineration technologies.

* * *

Charlotte Brody, RN
Coordinator
Health Care Without Harm
Center for Health, Environment, and Justice
P.O. Box 6806
Falls Church, VA 22040
Tel: 703-237-2249
Fax: 703-237-8389
Web: www.noharm.org

Providing Environmental Health Care for Migrant Workers and Professional Training for Hispanic Youth

Migrant Clinicians Network Austin, Texas

The Migrant Clinicians Network (MCN) is leading initiatives and partnering with other organizations and government agencies to bring about positive change in the way health care providers, particularly nursing professionals, address environmental health issues in their practice settings and communities.

The Agency for Toxic Substances and Disease Registry (ATSDR) invested in MCN's efforts to improve the environmental health capacity of health care providers who see migrant and seasonal farm workers as patients. This effort involved the development and implementation of a comprehensive environmental health education program for all levels of professional migrant health care providers. An extensive needs assessment is under way. When completed, it will map and prioritize environmental health needs for migrant farm workers geographically by region. It will also identify environmental health education needs specific to each kind of health care professional (i.e., physicians vs. outreach workers vs. midwives vs. nurses) and will identify the best educational sources specific to each topic and professional group.

MCN worked in partnership with the Medical Hispanic Center of Excellence to prepare Hispanic youth from South Texas to enter schools of higher education, including institutions geared to medical professions and allied health professions. A summer intensive program at the University of Texas Health Sciences Center in San Antonio is dedicated to this objective, followed by a year-long project in a health or allied health area. The program places Hispanic youth in internship and shadowing positions. Through support from the National Institute for Occupational Safety and Health (NIOSH), MCN worked with students recruited for the South Texas/Border Partnership for participation in a year-long occupational health and safety project.

MCN works with NIOSH (page 55) in an effort to assess what adolescent migrant farm workers know about agriculture's occupational risks. A series of focus groups were convened to understand more about the risks they face and their work habits, tasks, and safety knowledge. Evaluation results will guide safety and health professionals in formulating recommendations about age-appropriate agricultural work tasks and the development of appropriate safety and

health training materials and methods.

Rutgers University, Texas A&M University, and MCN are leading another project that focuses on children and pesticide exposure in an agricultural community on the U.S./Mexico border. The research study is examining how children become exposed to pesticides and how their activities might influence their exposure risks.

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Karen Mountain, MBA, MSN, RN
Chief Executive Officer
Migrant Clinicians Network
P.O. Box 164285
Austin, TX 78716
Tel: 512-327-2017
Fax: 512-327-0719
E-mail: kmountain@migrantclinician.org
Web: www.migrantclinician.org

Generating Community Awareness About Smoke and Asthma

Southside Area Health Education Center at Longwood College Farmville, Virginia

Southside Area Health Education Center (SAHEC), a nonprofit organization, serves a 15-county area in south-central Virginia. SAHEC is dedicated to

- supporting rural health practitioners
- supporting the training of health practitioner students, particularly nurse practitioners in rural areas
- recruiting and supporting local students interested in health careers
- partnering with local agencies to develop and carry out programs to improve the health of our family members.

With funding from private, public, and business sources, SAHEC nursing professionals work in the Prince Edward County Schools to improve the lives of children with asthma. The program includes teacher training, group work with children, and parent education. Special emphasis has been placed on school environment triggers.

SAHEC, using funding from the Virginia Department of Health's Tobacco Use Control Programs, has developed plain-language materials on the Virginia Clean Air Act, environmental tobacco (secondhand) smoke, and smoking cessation. These materials are targeted for use in health literacy workshops provided to health care providers in the SAHEC service area.

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Marna Neal
Program Coordinator
Southside Area Health Education Center
Longwood College
201 High Street
Farmville, VA 23909
Tel: 804-395-2863
Fax: 804-395-2864
E-mail: bethp@tiger.hsc.edu
Web: web.lwc.edu/staff/mneal/newSAHECweb.html

Building Infrastructure of Environmental Health Nurse Designees

Vermont Department of Health Burlington, Vermont

The Vermont Department of Health (VDH), a statewide public health system comprised of a central office and 12 district health offices, serves every part of the state. Since 1996, VDH has designated public health nurses in each of the district health offices as environmental health nurse designees (EHND). The EHND serve as consultants to town health officers and local boards of health. They provide information that links town officials with state and national environmental experts. The EHND also assist in maneuvering through the maze of agencies and organizations that have expertise related to a particular environmental health concern.

The VDH has developed a core environmental health curriculum that covers basic knowledge in such areas as air quality, water quality, solid waste, rental housing regulations, and risk communication. In addition, it conducts a yearly series of educational programs on topics including rabies control, bioterrorism, health-order writing, and a plan review of private septic systems. These programs have provided valuable information and connected public health nurses with experts who become important partners in solving environmental issues locally. For example, EHND work with the state toxicologist, state veterinarian, water quality specialists, and VDH legal counsel.

A monthly newsletter, *Environmental Health Designee Questions from the Field*, provides an excellent tool to discuss current environmental health information, clarify regulations, and identify resources. Articles have included discussion of the management of a lakeside camp with no septic system and the threat of rabies due to bats in an attic.

The skills of the EHND have been applied in many unique and challenging environmental health situations. Public health nurses have worked with communities in the aftermath of floods to assure safe drinking water by testing private wells. They have worked with mobile home owners on failed septic systems to assure contaminated areas are secure and reliable systems put in place. A broad public health perspective allows public health nurses to connect important issues such as water quality with the need for safe preparation of infant formula.

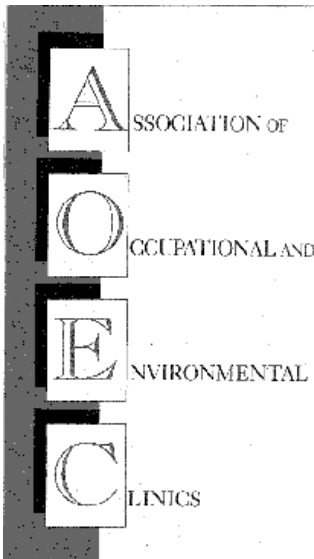
The EHND model is an important part of Vermont's public health infrastructure. Public health nurses provided with environmental health knowledge can identify local, state, and national resources to help address the often-complex environmental health issues facing a community. Vermont's EHND infrastructure also creates excellent opportunities for nursing research related to environmental health. VDH, in partnership with the University of Vermont, School of Nursing, is starting to focus on nursing research opportunities in this area.

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Sharon Moffatt
State Director of Public Health Nursing
Vermont Department of Health
108 Cherry Street
Burlington, VT 05401
Tel: 802-863-7347
Fax: 802-863-7229
E-mail: s.moffat@vdh.state.vt.us
Web: www.state.vt.us/health

Environmental Health in Nursing Education:

Schools of Nursing and Continuing Education Opportunities



THE UNIVERSITY of VERMONT



SIMMONS COLLEGE



HARVARD UNIVERSITY

“Unfortunately, environmental health is not mainstreamed into curricula, and the way to get content across to students is through experiential learning experiences. I take students on walk-throughs at a factory for site visits; there are many ‘aha’ moments.”

^{3/4}Assistant Professor Grace Paranzino, MS, RN, CHES, School of Medicine, MCP Hahnemann University

Promoting Environmental Health Education for Nurses

The Association of Occupational and Environmental Clinics Washington, D.C.

The Association of Occupational and Environmental Clinics (AOEC) works to promote the role of nurses as active participants in environmental health as part of its cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR).

AOEC and ATSDR planned and directed nursing education initiatives in West Virginia and Montana with goals to increase the knowledge of nurses in detecting environment-related symptoms and to improve their abilities in proactively addressing environmental health problems. In addition, the two organizations took leadership roles in demonstrating the importance of increasing environmental health content in nursing curricula.

A West Virginia workshop conducted in 1998 brought together nursing faculty from the University of Charleston, West Virginia University-Charleston Division, and Marshall University. Agenda topics on the first day of the workshop included exposure history-taking, toxicology, epidemiology, environmental infrastructure and resources, risk communication, and environmental justice. The focus was on Charleston's "chemical valley," an area dense with chemical plants. On the second day of the workshop, a National Library of Medicine staff member led a computer lab on environmental databases. In September 2000, AOEC and ATSDR held a follow-up program for West Virginia nurses on the health effects of dioxin and other chemicals.

A Montana program conducted in 1998, presented similar content as the one in West Virginia and added a distance-learning component. The program, held at Montana State University (MSU), was broadcast to seven additional Montana sites through the state's interactive telecommunication network. Participants included nursing faculty from MSU and Salish Kootenai College (a Native American college), state public health nurses, and nurses from the Indian Health Service. One indicator of this program's success was a participant's decision to pursue a graduate degree in pediatric environmental health. In 2000 AOEC also cosponsored

“Moving Upstream: Environmental Health and Nursing,” a 5-day course offered by Montana State University College of Nursing, Bozeman (page 29).

In response to widespread, unlawful residential use of the agricultural pesticide methyl parathion, AOEC and ATSDR presented a nursing initiative in Jackson, Mississippi, in 1999. When used in homes to kill roaches or other insects, methyl parathion can cause serious health problems in people and their pets. During this program, AOEC and University of Mississippi speakers provided information about pesticides as well as other environmental health topics of concern to residents throughout the state.

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Katherine Kirkland, MPH
Executive Director
Association of Occupational and Environmental Clinics
1010 Vermont Avenue, N.W., Suite 513
Washington, DC 20005
Tel: 202-347-4976
Fax: 202-347-4950
Email: aoec@aoec.org
Web: www.aoec.org

Concentrating Environmental Health Resources in the School of Nursing

Environmental Health Education Center, University of Maryland Baltimore, Maryland

The Environmental Health Education Center at the University of Maryland has been involved in environmental health for a decade. The center engages in research, training, and education and involves a broad, multidisciplinary audience including nursing professionals and union and community members. The center, designated a U.S. Environmental Protection Agency (EPA) Regional Lead Training Center (for federal regions III and V), has received grants in support of its work from the National Institute of Environmental Health Sciences (for environmental justice), the Centers for Disease Control and Prevention (for case-control research study on lead poisoning prevention), and EPA (for an environmental auditing program). Nursing professionals primarily, including the center Director, Barbara Sattler, RN, DrPH, staff and run the center.

The center's environmental health and nursing activities have provided an environmental health emphasis within the nursing school. Since implementing the first faculty development program on environmental health in 1992, the center has provided guest lecturers and a mentoring program for undergraduate and graduate nursing students that focuses on environmental health practice. In 1998, the school began to require graduate community health nurses to complete an environmental health course.

The Environmental Health Education Center officially moved to the School of Nursing from the School of Medicine in July 1999 as part of a strategy to create a model for the integration of environmental health in nursing education, practice, and research. This led to several major initiatives:

- A faculty development project in which the University of Maryland, Howard University (page 41), the National League for Nursing (page 31), and the Southern Regional Educational Board partnered to assist southern region nursing faculty in integrating environmental health into curricula. A major component of this project is a 3-day faculty development workshop provided throughout the southern region.

- The creation of a Virtual Resource Center for Nurses on Environmental Health (www.enviRN.umaryland.edu). This nurse-managed Web site provides information, educational programs, a bulletin board of environmental health conferences, links to federal agencies and nonprofit organizations, and several topic-specific chat rooms. Nurses can also sign up for an environmental health and nursing listserv at the site.
- Introduction of a new environmental health track for nursing students who pursue a master's degree in community health. Several new doctoral candidates have chosen research topics specifically in environmental health. One graduate went on to manage a new grant-funded project at the center on safe drinking water and nursing.

The center also won a grant from EPA to work with school-based nurses on environmental health and continues its involvement in the Health Care Without Harm campaign (page 17), a national coalition to address the environmental health threats posed by the health care industry.

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Barbara Sattler, RN, DrPH
Director
Environmental Health Education Center, School of Nursing
University of Maryland
655 West Lombard Street, Room 665
Baltimore, MD 21201
Tel: 410-706-1849
Fax: 410-706-0295
E-mail: bsattler@son.umaryland.edu
Web: www.nursing.umaryland.edu

Protecting Communities Through Preventive Environmental Health Activities

Montana State University, College of Nursing Bozeman, Montana

The College of Nursing at Montana State University (MSU), Bozeman, offers nursing students a variety of opportunities to integrate environmental health into their education. Epidemiology and community health courses coexist in the nursing curriculum, and faculty member Patricia Butterfield, PhD, RN, actively seeks ways to increase environmental health content in the nurse practitioner program.

A pilot 5-day short course in environmental health, “Moving Upstream: Environmental Health and Nursing” offered in July 2000, attracted nursing students and practitioners to Bozeman to learn about mitigating environmental conditions that impact health. The course featured noted speakers who discussed taking an exposure history, water quality awareness, and pesticides exposure. Geographic information system (GIS) maps were discussed as a nursing tool to identify groundwater levels, streams, and other topographical features that can link natural resources to environmental hazards and deteriorating community health or another targeted population. The maps can further link communities to hazardous routes (via waterways) in trades or industries, such as mining in the West or chemical plants located along rivers in the East.

Aggressive efforts toward identifying at-risk populations have resulted in the Agency for Toxic Substances and Disease Registry’s (ATSDR) investment in MSU’s College of Nursing to undertake an adult lead screening initiative at a Superfund site near Helena. A community that was severely exposed to lead from mining activities has now been identified as a target group especially vulnerable to renal disease and hypertension. Butterfield, who completed a postdoctoral fellowship in occupational and environmental health, has led the College of Nursing in addressing ongoing lead exposure at the site. Butterfield estimates that 10% of the affected population (roughly 1,000 individuals) now resides in Montana. The College of Nursing, with the Montana State Department of Health, will screen and identify adults who can then be treated. Data that links early, heavy lead exposure to later stage disease will result from the patient study and screening.

Butterfield says that the College of Nursing is committed to environmental health education because it complements traditional nursing practice and aids Montana families. “Environmental health goes beyond typical public health nursing,” she says. For example, during a chlorine spill emergency room, nurses knowledgeable about environmental health were able to mitigate contamination and contain further harm.

Nursing students, under Butterfield’s guidance, have produced a series of environmental health fact sheets, bound them into a booklet, and disseminated them to policy makers throughout Montana. The fact sheets address radon exposure, agricultural injuries in pediatric populations, water pollution from confined animal feeding operations, pesticide use, exposure to Hantavirus, and reduction of household hazardous waste. Other projects at MSU include a study of wood smoke and its impact on preschoolers’ respiratory health and a faculty workshop to establish a research agenda for environmental health nursing.

Along with Grace Paranzino, MS, RN, CHES, Butterfield served as co-facilitator for the ATSDR satellite broadcast in August 2000, presented nationally over the Centers for Disease Control and Prevention’s Public Health Training Network. She also presented an educational session to nurses at St. Peter’s Hospital in Helena, Montana.

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Patricia Butterfield, PhD, RN
Associate Professor
College of Nursing
Montana State University
207 Sherrick Hall
Bozeman, MT 59717
Tel: 406-994-2763
Fax: 406-994-6020
E-mail: pgb@montana.edu
Web: www.montana.edu

Supporting Environmental Health Leaders

The National League for Nursing New York, New York

The National League for Nursing (NLN) represents all levels of nursing education, gathers data on nursing programs, and publishes resources for nurse educators. NLN has committed its network of nurse educators to raise awareness about the need to integrate environmental health concepts into nursing curricula and to promote faculty development programs.

As a member of the National Advisory Board for the University of Maryland School of Nursing faculty development project (page 27), NLN has participated in efforts to address recommendations outlined in the Institute of Medicine report, *Nursing, Health, and the Environment: Strengthening the Relationship To Improve the Public's Health*.

NLN uses its Web site to communicate environmental health topics to its members. A section of the site is dedicated to environmental health. It links to the Web site provided by the University of Maryland School of Nursing with support from The W.K. Kellogg Foundation.

The NLN journal, *Nursing and Health Care Perspectives* (May/June 2000), featured an article coauthored by Barbara Sattler, DrPH, RN, and Martha Kelly, EdD, RN, on faculty development in environmental health. The article is in the education news section of the journal. Another issue of the NLN journal featured a peer-reviewed article on environmental health and nursing education (September/October 2000).

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Martha Kelly EdD, RN
Manager
NLN Council Affairs
National League of Nurses
61 Broadway, 33rd floor
New York, NY 10006
Tel: 800-669-1656 ext. 266
Fax: 212-812-0393
E-mail: mkelly@nlm.org
Web: www.nln.org

Using Case Studies To Integrate Environmental and Occupational Health into Nursing Curricula

**Simmons College and Harvard School of Public Health
Boston, Massachusetts**

Through the efforts of nursing faculty, a collaborative endeavor between Simmons College and the Harvard School of Public Health was established to integrate occupational and environmental health concepts into baccalaureate nursing curricula. The need to integrate these concepts became apparent with increasing opportunities for graduating baccalaureate-nursing students to work in environmental and occupational health settings.

Case Studies: A Tool for Integrating Occupational Health Concepts into Baccalaureate Nursing Curricula was developed by nursing faculty from Simmons College and Harvard School of Public Health, in collaboration with faculty from Vermont College, University of New Hampshire, and Rhode Island College. Case studies support a teaching methodology that helps nursing faculty address the necessary curriculum integration and introduce occupational and environmental health concepts to nursing students. In addition, case studies illustrate the case development process and provide a useful exercise in curriculum development. The document's authors describe the development of five case studies in occupational health. Each case provides ready content for the introduction of occupational health and encourages the development of critical thinking skills and effective response to clinical situations. The case study topics include lower back pain, lead exposure, neurotoxicity and pesticide exposure, HIV exposure in the workplace, and the occupational health history.

A second edition will update and broaden the first collection of case studies to include environmental aspects of nursing. The newer edition will provide scientific background, guidance in teaching methodology using a student-centered focus, and linkage points within standard undergraduate curricula. *Turning Point: Nursing, Health, and the Environment: A Case Study Approach* will provide teaching tools to prevent and reduce health risks associated with environmental and workplace hazards. Case studies are being pilot-tested and reviewed at several nursing schools.

The Occupational Safety and Health Educational Resource (Centers for Disease Control and Prevention/National Institute for Occupational Safety and Health) supported this effort at the Harvard School of Public Health.

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Carol A. Somers, ScD, RN
Assistant Director for Occupational Health Nursing
Dual Degree Program at Simmons College and Harvard University
300 Fenway
Boston, MA 02115
Tel: 617-521-2536
Fax: 617-521-3045
E-mail: csomers@hohp.harvard.edu
Web: www.hsph.harvard.edu

Creating Informational Resources and Shared Access for Educators

The Children's Environmental Health Network Washington, D.C.

The Children's Environmental Health Network (the network), a national multidisciplinary project, promotes a healthy environment primarily to protect the fetus and child from environmental hazards. The network focuses on research, education, and policy, and works with concerned professionals around the United States to address children's environmental health issues. Nurses play a key role in the network's volunteer committees, task forces, and working groups.

In June 1999 as part of its mission, the network organized and presented "Pediatric Environmental Health: Putting It Into Practice," the first national pediatric environmental health conference designed for health care providers and faculty. The conference provided a comprehensive picture of key concepts in the field of children's environmental health and created a forum to encourage interdisciplinary collaboration among nurses, physicians, educators, researchers, and other professionals. It also provided an appropriate venue in which to present the latest pediatric environmental health research and clinical case studies to a targeted yet diverse audience.

The network also conducts training sessions to assist nurses in incorporating pediatric environmental health into teaching and practice. These educational workshops have been presented at the annual meetings of organizations such as the National Association of Pediatric Nurse Associates and Practitioners and the National Association of Hispanic Nurses. Workshops that target school nurses and other school-based health professionals are in development. A 2-day session for nursing and medical faculty, "Teaching Pediatric Environmental Health," held in San Francisco, California, attracted over 100 educators. Participants discussed strategies for infusing pediatric environmental health into residency and nursing training programs.

The network established the first e-mail listserver that focuses on pediatric environmental health issues for professionals. It provides nurses, other health care providers, researchers, and child health and environmental professionals the opportunity to share information with colleagues. More than 700 members who represent various disciplines in 16 countries use the listserver.

Initiatives to heighten awareness of environmental health are under way at the network. They include training targeted to minority health care professionals and those who serve children most at risk; outreach to faith-based health care organizations; highlighting environmental health concerns on certification exams; and increasing professional development opportunities such as fellowships to support individuals who wish to focus on pediatric environmental health as a career.

A manual designed to assist nursing and medical faculty in the integration of pediatric environmental health into student course work has been developed as a companion to the network's training programs. Available at no cost on the network's Web site (www.cehn.org), *The Training Manual on Pediatric Environmental Health: Putting It Into Practice* provides guidelines and tools that health care faculty can use in teaching pediatric environmental health. Modules include case studies, discussion questions, and suggested assignments for use in a course or training program. The following modules can be downloaded individually from the network's Web site:

1. Introduction to Pediatric Environmental Health
2. Faculty Training Guide
3. Strategies and Tactics for Teaching
4. Advocacy for Pediatric Environmental Health
5. A Developmental Approach to Pediatric Environmental Health
6. Environmental History-Taking
7. Epidemiology
8. Childhood Lead Toxicity
9. Metal Toxicity in Children
10. Air Pollution
11. Children and Solvents.

The Web site also offers the *Resource Guide on Children's Environmental Health* to assist with patient education, clinical practice, research, community advocacy, and student nurse education. The guide directs users to key resources in children's environmental health, including organizations active in the field, data sources, Web sites, hotlines, and publications.

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Children's Environmental Health Network
110 Maryland Avenue N.E., Suite 511
Washington, DC 20002
Tel: 202-543-4033
Fax: 202-543-8797
E-mail: cehn@cehn.org (general inquiries)
E-mail: cehnlst-on@cehn.org (to subscribe to listserv)
Web: www.cehn.org

Changing Health Care Facilities From the Inside Out

Nightingale Institute for Health and the Environment Burlington, Vermont

The Nightingale Institute for Health and the Environment (NIHE) assists health care professionals in recognizing the link between human and environmental health and their role in creating needed modifications in health care practices to improve the health of humans and the environment. NIHE educates health professionals about the environmental impact of human activity, particularly within the health care industry.

Three initiatives at NIHE provide professional education and training on topics such as the adverse impacts of dioxin and mercury, strategies for reducing energy use, and improving waste management practices within health care facilities. NIHE believes that the initiatives can increase institutional awareness of current practices and encourage health care providers to eliminate source pollution and minimize other adverse impacts.

The Trustees Initiative educates trustees and health care leaders about the environmental impact of health care delivery. The initiative offers resources to help trustees improve organizational environmental performance and minimize adverse ecologic impact in the communities they serve. NIHE supports this initiative through retreats, publications, its Web site, and sharing information on best practices.

The Clinicians Initiative educates nurses and other clinicians working in health care about the environmental impacts of clinical practice. Armed with information, nurses are encouraged to work within their organizations to minimize adverse impacts and promote resource conservation. NIHE serves as a convener, facilitator, and collaborator with this group.

The Environmental Procurement Initiative educates the industry procurement sector on environmental impacts associated with specific products and services. This initiative emphasizes sustainability, resource conservation, and life cycles. NIHE collaborates with other groups in developing tools for decision making, serves as a convening agent, provides education and outreach to purchasing groups, and facilitates communication among clinicians, suppliers, and health care leaders.

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Hollie Shaner, RN, MS
President
The Nightingale Institute for Health and the Environment
P.O. Box 412
Burlington, VT 05402-0412
Tel: 802-846-1680
Fax: 802-846-1681
E-mail: hshaner@aol.com
Web: www.nihe.org

Educating Health Care Providers Through Teleconferencing

University of Vermont, Division of Continuing Education Colchester, Vermont

The University of Vermont Division of Continuing Education uses a variety of innovative technologies to create continuous learning opportunities for health professionals. These technologies include national teleconferences, videoconferencing, video streaming, Internet, and video productions. Health and the environment is a theme often used in continuing education programs targeted to clinical and public health professionals.

To educate health professionals and hospital administrators about the potential hazards of health care by-products, the University of Vermont produced a national teleconference in 1998 entitled, *The Health Care Industry's Impact on the Environment: Strategies for Global Change*. Later that year, the division partnered with the American Nurses Association to create a 1-hour independent video study module, *Natural Rubber Latex Allergy: Recognition, Treatment, Prevention*.

The university also produced a teleconference series, *Health and the Environment: Exploring Critical Connections*, which was presented twice during the following year. This four-part video series, available on the Internet via video streaming, was designed by nurses, physicians, and environmental science experts to explore the critical interrelationships among the environment, complex health problems, global environmental change, ecosystem disruption, and human activity. The series connects these issues directly to the practices of health professionals by focusing on cancer, asthma, bronchitis, and emerging infections that have environmental etiologies. It also emphasizes the role nurses and other health professionals can play in preventing negative environmental impacts. Video case studies document the stories of people and communities who have suffered environmental contamination.

The original 2-hour *Health and the Environment* teleconference series was subsequently edited to create four independent video study modules. Nurses can use the modules to earn nursing contact hours and continuing education credits.

The U.S. Environmental Protection Agency (EPA) funded another university-produced video, *Our Waste, Our Responsibility: Moving Toward a Pollution Prevention Approach in the Healthcare Industry*, which was created for pollution management and prevention agencies,

hospital administrators, trustees, facility managers, and staff at all levels within the health care industry. Designed to increase awareness of the problematic nature of waste management in the health care industry, the video clearly defines the problem, provides possible solutions, and illustrates how key stakeholders can collaborate to promote positive outcomes nationwide. The video shows how to manage health care by-products responsibly as part of a commitment to a healthy community. Video orders may be placed on the University of Vermont Professional Programs Web site (professional.uvm.edu/cgi-bin/pp/).

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Anne O'Brien, BSN, MSA
Faculty Senior Program Developer
University of Vermont, Continuing Education
30 South Park Drive
Colchester, VT 05446-2501
Tel: 802-656-5818
Fax: 802-656-3891
Web: learn.uvm.edu/index.php

Creating a Regional Environmental Health Nursing Curriculum

Howard University, Division of Nursing Washington, D.C.

Through partnerships, Howard University Division of Nursing faculty have made significant contributions integral to raising awareness about environmental issues that can undermine community health. In 1994, a faculty team was awarded a cooperative agreement through the Minority Health Professions Foundation and the Agency for Toxic Substances Disease Registry (ATSDR) to address issues of environmental health in the Mississippi Delta Region (MDR). Within the MDR, 219 counties are ranked as the areas most threatened by environmental hazards. The 5-year project increased the environmental health focus in baccalaureate nursing programs in MDR.

A faculty team published a comprehensive instructional guide for faculty and students in associate and bachelor degree nursing programs to incorporate regionally specific environmental health factors into existing curricula in schools of nursing. The modular curriculum, *Environmental Health and Nursing: Mississippi Delta Project* was distributed to almost 1,000 schools and organizations within and beyond the MDR. The modules are now being used in three places in the Howard University undergraduate nursing program. Faculty member Peggye Lassiter, RN, MSN, coauthored and coordinated the writing and publication of two modules—*The Role of Culture, Poverty, Race, and Economic Development on Environmental Health*, and *Community Perspectives: Community Organization, Empowerment, Partnering, and Education*. Additionally, activities such as workshops in environmental health and nursing for MDR nursing faculties and community nurses were held.

Howard University partnered with the University of Maryland School of Nursing (page 27) and others to implement a faculty development for southern region nursing faculty in integrating environmental health into curricula. This effort was supported by the W.K. Kellogg Foundation and the National Environmental Education & Training Foundation. Howard University faculty actively participated in curriculum development and workshop presentations.

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Dorothy L. Powell, EdD, RN, FAAN
Associate Dean
College of Pharmacy, Nursing, and Allied Health Sciences
Division of Nursing
Howard University
501 Bryant Street, N.W.
Washington, DC 20059
Tel: 202-806-7456
Fax: 202-806-5958
Email: dpowell@fax.howard.edu
Web: www.howard.edu

Environmental Health in Nursing Research



MCP Hahnemann University



“We need to make explicit the environmental conditions and how these conditions affect people’s health.”

¾Associate Professor Patricia Butterfield, PhD, RN, College of Nursing, Montana State University

Surveying Communities To Assess Environmental Health Awareness

MCP Hahnemann University, School of Medicine Philadelphia, Pennsylvania

MCP Hahnemann University has three programs that incorporate environmental health into curricula: the College of Nursing and Health Professions, the School of Medicine, and the School of Public Health. Nursing faculty provide environmental health educational opportunities for students through community-based research projects. Faculty members also direct a required second-year course for medical students that encompasses prevention, occupational and environmental health, and health care finance and delivery. An occupational and environmental health track in the School of Public Health has content similar to the College of Nursing and Health Professions.

Student research activities have focused on exposure history-taking, environmental risk communication, and the development and implementation of practice guidelines for environmental health response clinics that seek to evaluate community members living in close proximity to hazardous waste sites.

School of Medicine faculty member Grace Paranzino, MS, RN, CHES, serves as an instructor to students interested in occupational and environmental health. She and other nursing faculty work closely with local health departments to develop effective risk communication messages intended to illuminate the relationship between environmental toxicants and adverse health outcomes.

In a recent student-led environmental health research project, nearly 500 surveys were distributed to community members. The surveys inquired about the community members' environmental health concerns and education needs and their primary health care providers. Community members surveyed were concerned about drinking water contamination, food safety, air quality, and pesticides. Of the 416 responses tallied, 75% of the respondents wanted environmental health information to come from their primary care providers. Only 3.5% of the respondents said they had ever asked their provider about environmental health concerns, whereas 20% indicated that their physicians had initiated such discussions. Twenty-six percent indicated they would like environmental health counseling. Sixty-three percent of respondents

felt they would be comfortable asking questions of their health providers about their environmental health concerns.

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Grace Paranzino, MS, RN, CHES
Assistant Professor
School of Medicine
MCP Hahnemann University
2900 Queen Lane
Philadelphia, PA 19129-1096
Tel: 215-991-8469
Fax: 215-843-6028
E-mail: paranzino@drexel.edu
Web: www.mcphu.edu/medschool/medschl.html

Focusing on Risks Associated With Housekeeping

**University of North Carolina, School of Public Health
Chapel Hill, North Carolina**

More than 3 million housekeepers, janitors, and building custodians work in the United States, yet little is known about how their working lives and environments create health problems or risks for them. Principal investigator Bonnie Rogers, DrPH, COHN-S, FAAN, and other nursing faculty at the University of North Carolina at Chapel Hill, School of Public Health, conducted the Housekeepers' Health Study to examine the work and environmental conditions that potentially cause health hazards to this vulnerable population of workers.

The study methodology included policy analysis, focus groups, and "walk throughs" of 15 randomly selected buildings to observe working conditions and potential hazardous exposures. Numerous health hazards were identified, including exposure to blood, human waste, and chemicals throughout the work environment; inconsistent safety and training programs; vibration and machine-related ergonomic issues; extremes of hot and cold temperatures; stress; and hazards related to shift work. Steps were taken to correct hazardous conditions and involve housekeeping staff in decisions that affect the quality of their working environment and hours.

Nursing faculty have also worked on several Institute of Medicine study groups that addressed environmental health in nursing practice. Rogers co-led an international conference that addressed environmental health in nursing practice. The conference was attended by more than 400 participants from 20 countries.

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Bonnie Rogers, DrPH, COHN-S, FAAN
University of North Carolina
School of Public Health, Room 263, CB#7400
Chapel Hill, NC 27599-7400
Tel: 919-966-1765
Fax: 919-966-0981
E-mail: brogers@sph.unc.edu
Web: www.sph.unc.edu

Protecting Health on Both Sides of the Border

University of Texas, School of Nursing El Paso, Texas

The University of Texas at El Paso (UTEP) pursues research, policy, and service activities to address environmental health issues along the state's border with Mexico. On campus, the Center for Environmental Resource Management (CERM) provides university-wide leadership and coordination of activities that focus on environmental health, safety, well-being, and economic development along both sides of the border.

University researchers have linked high rates of asthma and allergies to poor air quality in El Paso and its surrounding communities. Researchers have also identified elevated lead levels in children from low-income families in certain zip codes. Water contamination and lead exposure are also local health concerns.

CERM's research findings have been incorporated into UTEP's School of Nursing. Undergraduate level courses have environmental health content integrated throughout nursing coursework. At the graduate level, the Overview of Environmental Health course is part of the Community Health Nursing major.

CERM also incorporates environmental health content into service activities. Agua Para Beber, a public education program that translates into 'Water To Drink,' was initiated to teach communities how to sanitize their water and keep it safe for drinking. The center also distributes high-tech portable lavatories to underserved families and communities in El Paso County and Mexico who would not otherwise have them. The lavatories prevent raw sewage from contaminating groundwater. The waste is collected and treated, then turned into compost.

The university is affiliated with the Center for Border Health Research, which seeks to bring together major regional research institutions and ensure a coordinated research agenda to improve border health. Partners include the University of Texas at El Paso, Texas Tech Health Sciences Center, and the University of Texas at Houston Health Sciences Center, School of Public Health. Environmental health has been prioritized as a center research subject.

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Maria Alvarez Amaya, PhD, WHNP-C
Professor
School of Nursing
University of Texas at El Paso
1101 North Campbell Street
El Paso, TX 79936
Tel: 915-747-8583
Fax: 915-747-7207
E-mail: mamaya@miners.utep.edu
Web: www.nurse.utep.edu/

Nurturing Environmental Health Leadership

University of Wisconsin at Oshkosh, College of Nursing Oshkosh, Wisconsin

Recent efforts to increase environmental content at the University of Wisconsin at Oshkosh, College of Nursing have resulted in notable advances. Faculty member Carol Van Dongen, PhD, RN, took a sabbatical leave to pursue environmental health and toxicology courses through the summer program at the Johns Hopkins University and then published *Environmental Health Risks*, an article in the *American Journal of Nursing* (September 1998). An initiative to incorporate environmental health content into the school's undergraduate and graduate nursing programs has been undertaken. An interdisciplinary course, Human Health and the Environment, is already offered at the College of Nursing.

Interest in conducting research related to environmental health issues and nursing practice is growing. In 2000, the College of Nursing completed a survey of 500 Wisconsin registered nurses, who represent a spectrum of education levels and work settings, to assess nursing beliefs regarding environmental health, perceived competencies, and barriers, and incentives related to addressing environmental health in their nursing practices.

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Carol J. Van Dongen, PhD, RN
Professor
College of Nursing, University of Wisconsin Oshkosh
800 Algoma Boulevard
Oshkosh, WI 54901
Tel: 920-424-2125
Fax: 920-424-0123
E-mail: vandonge@uwosh.edu
Web: www.uwosh.edu/con/

Federal Initiatives in Environmental Health and Nursing



“In dwelling upon the vital importance of sound observation, it must never be lost sight of what observation is for. It is not for the sake of piling up miscellaneous information or curious facts, but for the sake of saving life and increasing health and comfort.”

¾Florence Nightingale

The Nationwide Environmental Health Nursing Initiative

Agency for Toxic Substances and Disease Registry Atlanta, Georgia

The Agency for Toxic Substances and Disease Registry (ATSDR) is the principal federal public health agency involved with hazardous waste issues. The agency is responsible for preventing or reducing the harmful health effects of exposure to hazardous substances. Efforts include creating and providing resources and education to nurses and other health care providers about how to recognize and prevent exposure to hazardous substances. The publication of the 1995 Institute of Medicine report, *Nursing, Health, and the Environment: Strengthening the Relationship To Improve the Public's Health*, was supported in part through ATSDR funds. This publication sparked interest in building a national, coordinated strategy for environmental health and nursing. ATSDR is leading the Nationwide Environmental Health Nursing Initiative to guide national strategy and, with partners, develop the competencies of members of the national nursing corps to address environmental health issues.

In support of this initiative, ATSDR has partnered with the American Association of Occupational Health Nurses (page 8) and the Association of Occupational and Environmental Clinics (page 25) to provide education and training programs in Montana, Tennessee, Texas, and West Virginia. With support from ATSDR, Howard University's School of Nursing (page 41) created a nursing curriculum emphasizing environmental health principles. This curriculum, intended for use in Mississippi Delta nursing schools and public health departments, is now in its second edition and has been distributed across the nation. The curriculum is available on the National Library of Medicine's Web site (sis.nlm.nih.gov/Tox/ToxMiss.html). ATSDR has sponsored distance-learning courses in Montana and Mississippi. The agency also produced *Environmental Health: A Nursing Opportunity*, which was broadcast live by national satellite in 2000. This broadcast is now available via Web streaming on ATSDR's Environmental Health and Nursing Web site (atsdr.cdc.gov/EHN) and videotape. ATSDR also manages an environmental nursing listserver to keep nursing professionals connected to each other and with current environmental health issues. Videotapes and listserver participation can be obtained at atsdr-nurse@cdc.gov.

ATSDR is also funding the development of an environmental nursing tool kit. The tool kit will provide nurses with the materials they need to assess, prevent, and intervene in exposure to environmental hazards. The tool kit is one example of how ATSDR is supporting a national, collaborative, and coordinated effort to integrate environmental health into nursing education, practice, and research.

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Teresa Nastoff, RN, BSN
Nurse Health Educator
Division of Health Education and Promotion
Agency for Toxic Substances and Disease Registry
1600 Clifton Road, NE (MS E-42)
Atlanta, GA 30333
Tel: 404-498-0530 (direct)
Tel: 1-888-42-ATSDR (main)
Fax: 404-498-0074
Email: tnastoff@cdc.gov
Web: www.atsdr.cdc.gov

Teaching Children and Adults To Manage Asthma and Avoid Environmental Triggers

**Indoor Environments Division, U.S. Environmental Protection Agency
Washington, D.C.**

Indoor environmental pollution poses one of the nation's most significant environmental health risks. The Indoor Environments Division (IED) of the U.S. Environmental Protection Agency was created to address indoor environmental pollution concerns related to respiratory illness, particularly asthma, cancer, and other chronic health effects caused by radon, secondhand smoke, biocontaminants, air toxicants, and other indoor environmental pollutants.

IED collaborates with health care professionals and organizations to reduce the public health risks that result from poor indoor air quality. IED mobilizes national health care systems to incorporate environmental and medical management in asthma prevention. IED also works with nursing professionals to raise awareness about indoor air quality in schools and homes, including awareness about indoor environmental asthma triggers, lung cancer mitigation, and the risks associated with exposing children to secondhand smoke.

IED carries the environmental health message into schools via school nurses because they are uniquely positioned to provide information and motivate school personnel, parents, and students to take action and reduce exposures to triggers and pollutants in schools. IED works with the National Association of School Nurses to develop new asthma education modules (training materials) with strong environmental health components to assist nurses in educating staff, parents, and children. The modular program links the school indoor environment and asthma by incorporating action items from IED's Indoor Air Quality (IAQ) Tools for Schools action kit to reduce exposures and triggers in schools.

The IAQ Tools for Schools includes a compendium of checklists designed for use by school nurses and health technicians, school principals, teachers, engineers, and food service personnel to identify air quality problems in the school environment, develop action plans to mitigate them, and prevent future episodes. Both the kit and the module can help reduce exposures to asthma triggers and indoor pollutants. The IAQ Tools for Schools Kit is available free of charge and can be obtained at the Web site (www.epa.gov/iaq/) or by calling the hotline (1-800-438-4318).

IED collaborates with the American Lung Association (ALA), a volunteer-driven health organization that initiates educational, community service, advocacy, and research programs on lung disease, both nationally and at the grassroots level. ALA works with a network of community activists, nurses, and physicians to promote health and support environmental health initiatives. The ALA's six-session public health program, Open Airways for Schools, teaches high-risk, low-income urban children with asthma how to control their symptoms through avoidance of indoor asthma triggers. ALA is also actively working to integrate IAQ Tools for Schools with Open Airways for Schools as a way of helping to 'asthma-proof' schools.

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U.S. Environmental Protection Agency
Indoor Environments Division
1200 Pennsylvania Avenue, N.W. (6609J)
Washington, DC 20460
Tel: 202-564-9370
Tel: 1-800-438-4318 (hotline)
Fax: 202-565-2039
Web: www.epa.gov/iaq/

Occupational Health Professionals in Key Posts Influence Health Policy

**National Institute for Occupational Safety and Health
Washington, D.C.**

The National Institute for Occupational Safety and Health (NIOSH), the federal agency responsible for conducting research and making recommendations for the prevention of injury and illness in the workplace, performs worksite investigations requested by employers or employees. NIOSH also makes recommendations and disseminates information on workplace hazards and the prevention of illness, injury, and disability and provides training to occupational safety and health professionals. Nurses and scientists are key to carrying out NIOSH's mission.

Occupational health, part of the larger component of environmental health, involves workplace chemicals, chemical disposal, and toxic substances that affect workers at waste sites. Nurses conduct health hazard research; an institute nurse served on the committee that produced the IOM report, *Nursing, Health, and the Environment: Strengthening the Relationship To Improve the Public's Health* and a NIOSH nurse participates in the extramural training grant program. Another serves as project officer for hazardous substance training grants in the Education and Research Centers (ERCs). Nurses' environmental health backgrounds prepare them for interaction with the environmental health community.

Under Section 21 of the Occupational Safety and Health Act (OSHA), NIOSH is mandated to train professionals to carry out the act's safety and health provisions. Grant awards to 16 ERCs and a number of universities and graduate academic training programs support nurse graduates as they prepare for careers as practitioners, consultants, teachers, and researchers. The grants support graduate academic training for occupational and environmental nurses in an interdisciplinary environment.

In addition, continuing education is provided to regional practitioners. University program directors teach occupational and environmental health concepts to undergraduate nursing students as well as to students in advanced practice programs. For example, workplace and environmental health hazards in reproductive health are taught to graduate adult nurse practitioner students.

In research, nurse directors conduct doctoral student training programs and interdisciplinary faculty research, serve on intramural research committees, and publish extensively in peer review journals. Within NIOSH, nurses play key roles in developing and implementing the National Occupational Research Agenda (NORA). They serve on NORA teams, including Infectious Diseases, Organization of Work, Allergic and Irritant Dermatitis, and Exposure Assessment. A nurse chairs the NORA Liaison Committee, which provides outreach and commentary on the development, progress, and direction of NORA implementation. Several academic nurses have received NORA-funded research grants. Nurses also serve on the NIOSH Study Section.

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Marilyn A. Fingerhut, PhD
Chief of Staff
NIOSH
200 Independence Avenue, S.W.
Room 715 H, Humphrey Building
Washington, DC 20201
Tel: 202-401-0721
Fax: 202-260-4464
E-mail: mfingerhut@cdc.gov
Web: www.cdc.gov/niosh

Protecting Children's Health

Office of Children's Health Protection U.S. Environmental Protection Agency Washington, D.C.

The mission of the Office of Children's Health Protection (OCHP) at the U.S. Environmental Protection Agency (EPA) is to make protection of children's health a fundamental goal of public health and environmental protection in the United States. OCHP supports and facilitates EPA efforts to protect children's health from environmental threats. The following four areas are emphasized:

- public awareness
- community-based programs and education
- EPA regulations and standards
- science and risk assessment.

EPA participated with other organizations in convening

- a workshop focused on children's environmental health at the annual meeting of the American College of Nurse-Midwives in May 2000
- a 1-day workshop for Alaska public health nurse managers on environmental health
- two children's environmental health workshops at the annual meeting of the National Association of School Nurses in June 2000.

EPA and the American Nurses Association have partnered to develop continuing education programs on children's environmental health in print format, online, and through preconference workshops. EPA's Children's Health Program Advisory Committee recommended the development of an interagency environmental health strategy for health care providers, under the auspices of the President's Task Force on Environmental Health and Safety Risks to Children. This health strategy would enable EPA to work more closely with health care providers on environmental health issues.

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U.S. Environmental Protection Agency
Office of the Administrator
Office of Children's Health Program
1200 Pennsylvania Avenue, N.W. (1107)
Washington, DC 20460
Tel: 202-260-7778
Fax: 202-260-4103
Web: www.epa.gov/children

Teaching About Water Quality To Heighten Environmental Health Awareness

**Office of Ground Water and Drinking Water
U.S. Environmental Protection Agency
Washington, D.C.**

Through the National Drinking Water Advisory Council (NDWAC) and its report, *Health Care Provider Outreach and Education*, advances are under way to address environmental health and nursing at the U.S. Environmental Protection Agency's (EPA) Office of Ground Water and Drinking Water. NDWAC's working groups recommended an integrated strategy for EPA and the Centers for Disease Control and Prevention (CDC) to use in drinking water protection. The strategy aims to inform and educate health care providers, including nurses, to counsel persons about the quality of their drinking water, and recognize, report, treat, and prevent adverse health effects that can be caused by infectious and noninfectious agents in drinking water.

Initiate Near-Term Activities

EPA projects over the near term would address patient questions that arise as a result of Consumer Confidence Reports, waterborne disease outbreaks, claims of water filter and bottled water advertisers, or other sources, and would set the stage for longer term health care provider partnerships. The agency intends to work with partners to produce the following projects:

- *Concise patient and group-specific information packages* that emphasize risk characterization, assessment, and avoidance. EPA should present health effects information (including avoidance behavior) in clear and simple language and should draw upon a wide range of refereed sources. In addition, EPA can identify the results of cause/effect research validated by peer-reviewed work and in emerging science.
- *A needs assessment* of targeted health care provider groups (particularly doctors and nurses) to see how best to reach them with information on drinking water. This assessment could be done as part of a broader EPA effort to look at other environmental health issues such as contaminated fish and pesticide poisoning. Such an assessment

could include formative research (e.g., qualitative assessment, message testing, strategy feedback) and ongoing assessments of message, audience, and effects for each targeted health care provider group.

- *Pilot projects* for health care provider outreach and education to sharpen both messages and outreach products as well as to ensure relevance. These outreach/education projects can focus on specific patient groups or geographic areas where drinking water contamination is a major health concern. Local information resources may be developed to assist health care providers with specific drinking water topics pertinent to their community (e.g., taste and odor findings that do not constitute health risk). Nongovernment and professional organizations as well as government groups could carry out the pilot projects.
- *Training materials* to provide health care providers with an appreciation of the various routes of environmental exposure that can result in transmission of acute and chronic disease-causing agents. EPA and CDC could work in partnership with government, nongovernmental organizations, and professional organizations.

Initiate Longer-Term Activities

Planned EPA projects over the longer term include the description of activities that follow.

EPA and its partners: Actively promote the addition of environmental health content (including drinking water issues) to university/graduate curricula and educational programs for practicing health care providers.

EPA: Nationally expand intra-agency coordination of longer term health care provider education and practice changes, using multimedia and cross-sector approaches. This multimedia/partnering approach is recommended because (a) EPA has a relatively small number of staff trained as health care providers or in public health; (b) several EPA offices have promising initiatives to reach health care providers regarding specific environmental health hazards; (c) the Institute of Medicine has made recommendations to Congress that environmental health should be integrated into basic nursing and medical school education; and (d) several federal agencies and national

professional organizations have been involved in addressing this issue. Outcomes from this effort could include

- encouragement of medical, nursing, and other health care provider schools to expand curricula on the recognition, avoidance, and treatment of environmental health problems (possibly including the provision of the actual training materials)
- curriculum enhancement of continuing education programs for practicing health care providers
- enhanced standardized medical and nursing reference manuals
- training materials prepared through expert groups and professional organizations
- establishment of advisory bodies to oversee curriculum integration
- expansion of environmental health internships.

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Sherri Umansky
U.S. Environmental Protection Agency
Office of Ground Water and Drinking Water
1200 Pennsylvania Avenue, N.W. (4607)
Washington, DC 20460
Tel: 202-260-0432
Fax: 202-401-6135
E-mail: umansky.sherri@epa.gov
Web: www.epa.gov/safewater