UNIVERSITY OF CINCINNATI
EDUCATION AND RESEARCH CENTER

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ANNUAL REPORT 2005-2006

Table of Contents

II. Introduction and Executive Summary

A. Major Accomplishments

Pilot Research Project (PRP) Program

Since our last reporting period, there have been 16 peer-reviewed articles and conference presentations directly resulting from PRP pilot research grant activities. Thus far the external funding received by prior PRP recipients as a result of grants submitted using pilot data from their PRP projects , more than $3.5 million amounts to about eight times the total amount of PRP grants awarded to date. The grant sponsors included NIOSH, USDA and CDC

Grant Writing Workshop

In an effort to build and strengthen the grant writing skills of trainees and junior faculty, we have initiated an annual grant writing workshop on the University of Cincinnati campus. The first grant writing workshop was given last year (2005). Each PRP partner university was invited to send two researchers to attend the 2-day workshop, ideally one occupational health and safety doctoral-level trainee or a junior faculty (up to the rank of Assistant Professor) with some occupational safety and health background; and one senior faculty (Associate or Full Professor) with no or limited prior experience in occupational safety and health research. The 2006 workshop was held April 3-4, 2006 and attracted twenty-one participants. The workshop participants represented the University of Cincinnati, Bowling Green State University, Western Kentucky University, Eastern Kentucky University, Purdue University and the Medical University of Ohio. In response to feedback from prior workshop attendees, we invited NIOSH representatives to make presentations. Drs. Bernie Kuchinski, Linda Frederick (NIOSH-Atlanta office) and R. DeLon Hull, along with Mr. John Talty, made presentations in the areas of NIOSH Extramural Programs, grant application and review process.

New Research Collaborations

One of the objectives of the Pilot Research Project program was to stimulate collaboration among investigators in the ten (10) participating universities. Examples of two of the collaborations that have developed which have had important accomplishments during the past year follow. One of the interactions involves the development of a research proposal exploring respiratory protection from agricultural exposures. This collaboration involves Dr. Tiina Reponen (University of Cincinnati Environmental and Occupational Hygiene (EOH) program) and Dr. Susan Jones of Western Kentucky University. Another collaboration utilizes the expertise of UC ERC and Purdue University to investigate the biomechanical and physiological responses that occur while handling beverage shells of different designs used in the beverage industry. This collaboration focused on research training of graduate students at the University of Cincinnati and Purdue University under the direction of Dr. Kermit Davis (EOH) and Drs. James McGlothlin and Shirley Rietdyk of Purdue University.

NORA Town Hall Meeting

The University of Cincinnati ERC partnered with NIOSH and the Ohio State University NIOSH-supported Agriculture Health and Safety Center in developing plans for and conducting a Town Hall Meeting on the National Occupational Research needs for the region and for the

manufacturing sector. The Town Hall Meeting was held at the Edison Community College in Piqua, Ohio and attracted about 100 participants. Presentations were made by several ERC trainees and faculty. Topics emphasized by the presenters included: international occupational health training and research needs, small business concerns, agriculture health and safety.

International Nanotechnology Conference

Faculty of several ERC programs, in partnership with NIOSH and a number of other organizations, are involved in organizing and planning for an International Conference on Nanotechnology: Occupational and Environmental Health and Safety. The Conference is scheduled for December 4-7, 2006 in Cincinnati. Faculty from the Occupational Safety & Health Engineering (Drs. Shell and Genaidy) and Continuing Education (Dr. Judy Jarrell) programs are the ERC programs most actively involved. Other ERC faculty involved are Dr. James Lockey (Occupational Medicine) and Dr. Sergey Grinshpun (Environmental and Occupational Hygiene).

Environmental and Occupational Hygiene (EOH)

Many trainees and faculty received awards and other recognitions for their accomplishments. For example, Susan Kotowski (PhD student EOH} received the Ryan Fellowship from the University of Cincinnati, the International Society of Biomechanics Matching Dissertation Grant award, American Society of Safety Engineers Foundation/Ford Motor Company Scholarship, membership in the Human Factors and Ergonomics Society with honors, University of Cincinnati Summer Research Fellowship, and a University of Cincinnati fellowship for Preparing Future Faculty. The dissertation research work of Shu-An Lee, Ph.D. (with faculty members Dr. Tiina Reponen and Sergey Grinshpun and Roy McKay (Occupational Medicine) was recognized with the John M. White award at the 2006 AIHce for the best respiratory protection paper published in 2005.

Dr. Scott Clark received the 2006 Amicus Poloniae Award from the Republic of Poland to recognize "extraordinary accomplishments in development of Polish-American relations" for ten years of support in the development of the occupational hytine profession in Poland. **Dr. Kermit Davis** received the International Society of Biomechanics Promising Young Scientist Award and the Hallman Visiting Professorship at the University of Waterloo. **Dr. Amit Bhattacharya** was elected a Fellow in the inaugural class of the Biomedical Engineering Society. **Dr. Sergey Grinshpun** was guest editor of a special issue of the Journal of Aerosol Science, Measurement and Characterization of Bioaerosols. **Dr. Tiina Reponen** has been elected to Board of Directors, American Association for Aerosol Research. **Dr. Carol Rice** was a co-arranger for Living in a Chemical World III, Bologna Italy and is the Convenor of the annual meeting of Occupational Hygiene Women Faculty. **Dr. Glenn Talaska** has been appointed to the International Scientific Advisory Group to plan the International Society for Biological Monitoring 7th Meeting to be held in Peking China, October 2007.

During 2005-06 the faculty, students, staff, alumni and advisory board members contributed to the preparation of the ABET Self-study.

The Masters in Industrial Hygiene and Safety –based at the Sardar Patel University in the State of Gujarat, India, which was developed by an ERC alumnus (Maharshi Mehta MS (UC 1983), CIH, CSP and aided continuously by EOH faculty, other alumni and others, made preparations

to accept its tenth entering class in September 2006. Its graduates are now recognized by the Government of the State of Gujarat India (population 48 million) as qualifying as safety engineers under its Factories Act.

Two faculty members (Clark and Rice) helped organize and participated in a "Workshop on Practical Methods for the Control of Silica Dust in Small Scale Facilities" that was held in Beawar, Rajasthan, India in January 2006. A wide range of stakeholders participated: silica mill owners and operators, government regulators, government scientists and engineers, university investigators, students and workers.

The unexpected discovery of high levels of lead in new paints offered for sale for consumer use in a number of Asian countries poses a major risk to workers, children and others in future years and is indicative of likely problems already occurring. In response to this finding a concerted effort is being made to widely publicize this information with the intent on promoting bans on such use in the countries where it is still offered for sale.

Occupational Health Nursing

Occupational Health Nursing (OHN) trainees organized, implemented and evaluated health fairs at two manufacturing sites, thus allowing the OHN to expand health promotion activities to approximately 800 employees. Another project included the evaluation and cost-effectiveness of an on-site occupational health program. The results are now being used to determine whether or not the program should be extended nationally. Other projects were evaluation of a medical waste disposal process in which recommendations were made to the hospital health and safety department; and a project involving assessment of job hazards in a waste recycling plant. Again, recommendations were made to the owners of the recycling plant. Partnerships with the Ohio American Cancer Society, the Health and Productivity Institute of the Tri-C Business College (Cuyahoga County OH), and the Governor's Council for Healthy Ohioans were developed to enhance development of workplace health promotion and risk reduction activities in Ohio and students were invited to join in statewide occupational health activities.

The Occupational Health Nursing in partnership with NIOSH-ERC Continuing Education and the Ohio Association of Occupational Health Nurses sponsored the Ohio Association of Occupational Health Nurses State Conference, *"Presenteeism: The Newest Variable in the Productivity Equation"* on March 17-18, 2006. Three of the conference sessions were presented by OHN faculty. The conference was evaluated as one of the best conferences in over 15 years. Students were involved in the planning and implementation of the conference and presented evidence-based research posters (R2P) on workplace violence prevention strategies, business benefits of transitional work programs, and strategies to prevent injuries from sharps in operating room personnel

Occupational Medicine

Additional training content not available in existing courses was included in a recently-developed new course, Special Topics in Preventive Medicine, by Dr. Clara S. Ross. The course covers a number of important topics covered by the residents' board-certification examination, including food and water safety, travel medicine, immunizations, health and wellness programs, patient safety and disaster preparedness. Resident professional development goals met included

the enrollment of residents in professional occupational health and safety groups and support of their attendance at regional and national occupational health conferences.

Dr. James Lockey received a Presidential appointment to serve on the National Advisory Board on Radiation and Worker Health. Dr. Roy McKay was one of the recipients of the American Industrial Hygiene Association John M. White Award for their November 2005 publication, "Respiratory Protection Provided By N95 Filtering Facepiece Respirators Against Airborne Dust and Microorganisms in Agricultural Farms". The research for this publication was doctoral research of an environmental and occupational hygiene (EOH) student (Lee, SA) and also involved EOH faculty and others as co-authors.

Occupational Medicine collaborated with Occupational Health Nursing in the planning and presentation of the conference Workplace Health, Wellness, and Safety: Evolving Issues, September 23-24, 2005 in conjunction with the Western Ohio Occupational & Environmental Medical Association, Tri-State Occupational Medical Association, Southwest Ohio Occupational Health Nurses Association and the Cincinnati NIOSH Education & Research Center Continuing Education Program.

Occupational Safety and Health Engineering

A Special Issue of "Theoretical Issues in Ergonomics Science", Vol. 7, Number 3, May-June 2006, *Taylor & Francis,* devoted to Safety and Health Engineering: Research to Practice, was edited by Drs. Shell and Genaidy of the OSHE program. Each article in the issue was developed by a small group of OSHE and other graduate students enrolled in the new course, Safety and Health Engineering-Research to Practice (20 INDS 747) along with faculty monitors. The new course development was funded by the UC ERC NORA program.

The American Society of Safety Engineers (ASSE) Student Section Southwestern Ohio Chapter was chartered August 31, 2004 (Dr. Richard Shell, program director, serves as Faculty Advisor and Dr. Ash Genaidy, deputy director, is the Co-Faculty Advisor). Since that time the student membership has made excellent progress and accomplishments. For example, the Chapter officers and other members attended the First Annual National Future Safety Leaders Conference held in Cleveland 2005, and five students have registered to attend the 2nd Annual Conference to be held at the Hilton Hotel in St Louis MO November 2-4, 2006. During 2005-06 the Student Section Newsletter was established.

Occupational Safety and Health Engineering (OSHE) faculty have continued to work with Ken Simonson, Director of University of Cincinnati Emerging Ethnic Engineers to offer the OSHE program with NIOSH Trainee support to minority students. During the 2005-06 year two minorities, one African-American and one Native-American, were offered admission and both accepted. They will likely complete their MS degree requirements by June 2007.

Hazardous Substance Academic Training

James Couch received the award for the best occupational epidemiology poster from the AIHA Occupational Epidemiology Committee at the 2006 AIHce: Analysis of beryllium exposures at a beryllium manufacturing facility. Coauthors-C. Rice, M. Schubauer-Berigan, M. Peterson, R. Hornung. Mr. Couch was also a co-author of a paper receiving the Alice Hamilton Award for

best paper in the Human Studies Category at NIOSH. A nested case-control study of leukemia mortality and ionizing radiation at the Portsmouth Naval Shipyard. Authors—T. Kubale, R. Daniels, J. Yiin, J. Couch, M. Schubauer-Berigan, G. Kinnes, S. Silver, S. Nowlin and P. Chen.

Continuing Education

Dr. Judy Jarrell developed three additional training modules for Occupational Medicine for on-line delivery. These training modules are increasingly being utilized and were developed in response to requests by the participants in the in-class four (4)-week Occupational Medicine Training Program. Three more modules are planned for development and offering on-line in the next year.

Biological Monitoring

During the past year a successful supplemental application to NIOSH for a Biological Monitoring component program was developed. This program will include M.S, Ph.D. and post-doctoral trainees and is to be directed by Dr. Glenn Talaska a member of the Environmental and Occupational Hygiene faculty. New courses are being planned for this program and it is expected that these and current courses in Biological Monitoring will be attended by trainees in several of the ERC programs as well as others from the Department of Environmental Health (e.g. toxicology and epidemiology) and elsewhere in the University of Cincinnati and the local community.

B. Significant Changes since July 1, 2004 – June 30, 2005

Environmental and Occupational Hygiene

Mr. Jay Jones, CIH was appointed adjunct Associate Professor of Environmental Health. He is responsible for the planning and conduct of the two-quarter course Identification of Potential Workplace Exposures during which students conduct walk through assessments, describe observations and propose strategies to evaluate potential hazards.

The content of two courses has been enhanced to include topical areas: Principles of Occupational Exposure Assessment, 26-EIH-707 (Talaska) now includes a 1.5 hour lecture on Control Banding; Hazardous Materials Management, 26-EIH-834 (Clark) now includes coverage of the National Incident Management Plan and requirement that students successfully complete the on-line course, IS-700 in the National Incident Management System. The Graduate School approved a new course, Workplace Exposure Measurements—follow-up, 26-EIH-971 (Rice) during which students review their graded comprehensive survey reports from Evaluation of Workplace Exposures, 26-EIH-775 (Rice), and cover advanced topics including an ethics scenario.

Occupational Health Nursing

Jane Christianson, RN, MSN, a graduate of the OHN master's and a former member of the OHN Advisory Board was hired as a faculty member. She is teaching community health nursing at the undergraduate level and supervising undergraduates in occupational health and safety field experiences. Under Ms. Christian's supervision, students conduct employee and family health fairs, employee health screenings and health promotion activities. It is expected that Professor Christianson will be a useful member of MS and PhD research committees. Additionally, two

researchers from Cincinnati Children's Hospital & Medical Center, Center for Professional Excellence were appointed as adjunct Research Scientists at the College of Nursing. These researchers, Dr. Myra Huth and Dr. Nancy Daraiseh (PhD graduate OSHE), link students with research projects, serve on dissertation committees, mentor and critique student research.

Occupational Medicine

Dr. Rohs, a past NIOSH ERC-supported occupational medicine resident trainee, joined the full-faculty in December 2005 and will focus her efforts on occupational pulmonary research and clinical issues. Additional volunteer faculty members have been recruited to serve as members of the Residency Advisory Committee and as clinical preceptors for residents' clinical occupational medicine training.

Occupational Safety and Health Engineering

Dr. Anil Mital has left the OSHE core faculty to focus all of his effort on manufacturing. He has been replaced by Dr. O. (Sam) Salem, Associate Professor, Civil and Environmental Engineering who has considerable occupational safety experience. Dr. Genaidy and Dr. Shell have been working with Dr. Salem on an increasing basis for the past three years. These activities include research proposals, publications, student advising and graduate committees largely directed toward safety and health issues in construction management.

Three new courses have been developed and taught during 2005-06: Advanced Occupational Biomechanics (20 INDS 753) taught by Dr. Tom Waters, Adjunct Professor from NIOSH; Safety and Health Engineering-Research to Practice (20 INDS 747) taught by Dr. Ash Genaidy, and Safety by Design (20 INDS 630) taught by Dr. Woojin Park. In addition, Dr. Nancy Daraiseh is working to develop a course: Behavior Based Safety (20 INDS 632).

Hazardous Substance Academic Training

The content of two courses has been enhanced to include topical areas. Hazardous Materials Management, 26-EIH-834 (Clark) as previously mentioned under Environmental and Occupational Hygiene, and Applied Risk Assessment 26-TOX-878 taught by Dr. Jon Reid, The latter course now includes use of the Global Information System software ArcView. Exposure scenarios can be entered and, over time, exposures such as plumes or ground water contamination can be envisioned on a geographic plane, and tracked to various receptors.

C. ERC Website

University of Cincinnati ERC

http://eh.uc.edu/erc/

The following are direct links to the major component programs that make up the University of Cincinnati ERC:

Environmental and Occupational Hygiene

http://eh.uc.edu/erc/programs_Industrial_hygiene.asp

Occupational Health Nursing

http://eh.uc.edu/erc/programs_occupational_health_nursing.asp

Occupational Medicine
http://eh.uc.edu/erc/programs_occupational_envir_med.asp

Occupational Safety and Health Engineering
http://eh.uc.edu/erc/programs_safety.asp

Continuing Education/Outreach
http://eh.uc.edu/erc/programs_cont_ed.asp

Pilot Research Project Program
http://eh.uc.edu/erc/programs_pilot.asp

III. Program Reports

A. Program Title: **Center Administration, Outreach, Interdisciplinary Coordination and NORA Research Support**

B. Program Director: **C. Scott Clark PhD, PE, CIH**

C. Program Description

The administration of the University of Cincinnati Education and Research Center is based in the Department of Environmental Health in the College of Medicine. The Director and Deputy Director (Carol H. Rice PhD CIH) are assisted by Amber J. Twitty, ERC Program Coordinator and by Business Office staff of the Department of Environmental Health and of the Colleges of Engineering and Nursing. The UC ERC programs are located in a total of three colleges. In addition to the Center Administration, the programs in Continuing Education, Environmental and Occupational Hygiene, Occupational Medicine, Hazardous Substance Academic Training, NORA research support and the Pilot Research Project programs are also located within the Department of Environmental Health of the College of Medicine. The Occupational Safety and Health Engineering program is located in the College of Engineering and the Occupational Health Nursing program is located in the College of Nursing.

The Directors and Deputy Directors of the ERC programs serve as the Internal Advisory Committee. The ERC is also served by an External Advisory Committee which meets about once a year. Current members of the External Advisory Committee are:

Ken Bloemer, Ph.D.
Director, Innovation and Strategic Services
Techsolve

Cheryl Christensen, MD
Corporate Manager of Occupational
Medicine International
Procter and Gamble

Melody A. Clark, Ed.D.
Academic Director, Distance Education &
SR. VP & Provost Office
University of Cincinnati

Mike Donahue
Safety Consultant
Ohio Bureau of Worker Compensation
Division of Safety and Hygiene

Richard Fulwiler, Sc.D., CIH
President
Technology Leadership Association

Richard T. Gilgrist, CIH
US Dept. of Labor
OSHA

Michael Gunn, REM, Ph.D., CSE/WSO
Office of Environmental Management
City of Cincinnati – Retired

John Hochstrsser, Ph.D., PE, CIH, DEE
American Tool - Retired

Nan Migliozzi, RN, MSN
Ohio Department of Health

Tim Ping, MS, CSP
GE Aircraft Engines

Jim Price, CIH
ACGIH

William Wagner, Ph.D., DD
NIOSH/ACGIH – Retired

The University of Cincinnati ERC National Occupational Research Agenda (NORA) support program has several inter-related goals, including to:

- To Conduct Outreach for Research to Practice
- Promote Interdisciplinary Research Development
- Increase the Research Skills of Trainees and Faculty
- Enhance the Pilot Research Project Program

Activities/accomplishments, products and future plans related to each of the above four goals are presented in the remainder of this section. (It should be noted that many of these activities are inter-related. Many of the activities to achieve one of these goals are also effective to achieving one or more of the other goals. For example, one of the activities to enhance the impact of the Pilot Research Project program, the development and dissemination of a CD of the proceedings of the Annual Pilot Research Project Symposium, is also part of our outreach to help put into practice results of the pilot research projects. Increasing the occupational health and safety research skills of trainees and faculty is achieved through efforts to enhance the Pilot Research Project program). Faculty support was provided under the NORA program for promoting interdisciplinary research and coordinating outreach efforts in research to practice.

C. Program Activities and Accomplishments

Outreach Activities for Research to Practice

The Outreach for Research to Practice activities include, outreach activities by faculty from each academic program and dissemination of the results of the Pilot Research Project Training Program. Examples of these outreach activities are presented in the following.

NORA Town Hall Meeting in Piqua, OH March 6, 2006 The University of Cincinnati ERC was asked in November 2005 to participate as a local host for this meeting. Included in our responsibilities was selection of a venue, and chairing the morning session. We interacted extensively with personnel from NIOSH Washington (Max Lum Ed D et al) and NIOSH-Cincinnati (Mary Lynn Woebkenberg et al) All ERC programs were involved in preparing lists

of possible attendees and in contacting these individuals and organizations. Transportation was provided to allow ERC trainees to attend this important NORA research and outreach activity. The Town Hall Meeting was held at the Edison Community College in Piqua, Ohio and attracted about 100 participants. Presentations were made by several ERC trainees and faculty. Topics emphasized by the presenters included: international occupational health training and research needs, small business concerns, agriculture health and safety,

Environmental and Occupational Hygiene (EOH) Outreach

EOH faculty (Clark and Rice) assisted in the development and presentation of a "Workshop on Practical Methods for Control of Silica Dust in Small Scale Facilities" in Beawar, Rajasthan, India, for mill operators, owner, workers and government agencies. Dr. Bhattacharya continued his outreach to the Hamilton County Health Commissioners Fall Task Force to provide guidance to prevent falls in the community. Dr. Kermit Davis provided information on ergonomics-wellness integration for employees at a nearby university and presented a seminar on use of workers' compensation data to understand risk of musculoskeletal disorders to faculty and students in the Division of Epidemiology and Biostatistics.

Occupational Medicine (OM) Outreach

Occupational Medicine collaborated with Occupational Health Nursing in the planning and presentation of the conference Workplace Health, Wellness, and Safety: Evolving Issues, September 23-24, 2005 in conjunction with the Western Ohio Occupational & Environmental Medical Association, Tri-State Occupational Medical Association, Southwest Ohio Occupational Health Nurses Association and the Cincinnati NIOSH Education & Research Center Continuing Education Program.

Occupational Health Nursing (OHN) Outreach

Faculty and students mad a significant impact on the health of workers during 2005-2006. Health fairs were conducted at two manufacturing sites, thus allowing company OHNs to expand health promotion activities to approximately 800 employees. Partnerships with the Ohio American Cancer Society, the Health and Productivity Institute of the Tri-C Business College, and the Governor's Council for Healthy Ohioans were developed to enhance development of workplace health promotion and risk reduction activities in Ohio. These partnerships have resulted in invitations to join in statewide occupational health activities. A state wide conference on "presenteeism" was offered in conjunction with the Ohio Association of Occupational Health Nurses; OHN faculty presented three of the conference sessions. Evaluations indicated that the conference was one of the best in the last 15 years, addressing contemporary occupational health issues. During this last year OHN faculty have continued leadership positions in the state and local occupational health associations. Faculty and students have taken leadership in a regional study of nurse supply and demand as a request from the Greater Cincinnati Health Council. Dr. Gates was also appointed as a partner in the Kentucky State Plan, "Fit Kentucky", whose purpose is to increase physical activity in the workplace. As a part of this initiative, occupational health nursing has developed relationships and provides consultations with eight manufacturing companies for the purpose of promoting health and wellness. These relationships expand options for both research and practice for all disciplines in the ERC.

Occupational Safety and Health Engineering (OSHE) Outreach

A major outreach activity of the OSHE faculty has been planning for the International Conference on Nanotechnology: Occupational and Environmental Health and Safety which is expected to attract a number of individuals from outside the occupational health and safety community. OSHE faculty have also mentored junior faculty from the Ohio University in performing occupational health and safety research.

Interdisciplinary Interaction and Coordination

Interdisciplinary interaction among trainees and interdisciplinary research development is fostered through a number of courses and workshop activities. A major component of the interdisciplinary interaction occurs through the Occupational Health, Hygiene and Safety Workshop in which all ERC trainees interact in multidisciplinary teams over a three quarter period. Dr. Kermit Davis (EOH) is the Workshop coordinator and faculty from each of the other programs, participate as Advisors. The activities in this Workshop were focused on conditions at particular workplaces on which the teams focused to identify potential problems and begin to develop solutions.

Dr. Woojin Park (OSHE) developed interdisciplinary collaborations with several UC faculty including, Dr. Seongho Song, a statistician in the Department of Mathematical Sciences and Dr. Martin Levy, a quantitative analyst and applied statistician the College of Business. The collaboration with Dr Song has already resulted in the development of two research proposals: Biomechanical Tools for Individual Worker/Soldier Extremity Protection and Workplace Design for Obese Workers Two publications have also been developed: Singh, D., Park, W., Huston, R. L., Song, S. (Submitted to Journal of Applied Biomechanics). Quantitatively Representing Balance Strategies of Goal-directed Human Motions; Cross, K., Park, W., Song, S. (To be submitted). Effects of Body Extremity Armor Weights on Soldier Performance. The collaborations with Dr. Levy also involved a doctoral student (D. Singh) who was a recipient of a PRP grant. Their research focused on obese workers and has already resulted in the development of three manuscripts: Singh, D., Park, W., Levy, M. S. (Submitted to Applied Ergonomics, September 2006). Obesity Does Not Reduce Maximum Acceptable Weights of Lift; Singh, D., Park, W., Levy, M. S. (To be submitted). NIOSH lifting equation may not protect obese workers; Singh, D., Park, W., Levy, M. S. (To be submitted) Obesity Effects on Postural Sway during Prolonged Standing.

Faculty in the College of Nursing have been actively encouraged and mentored to partner with other occupational and environmental health researchers in the ERC to expand efforts of nursing and other disciplines to focus on NORA research priorities. Three nursing faculty, one in women's health and one in psychiatric nursing and one in nutrition have partnered with either occupational health nurses or other ERC disciplines.

During the past year Occupational Health Nursing doctoral students worked on interdisciplinary research projects with faculty in the College of Medicine, Engineering, Education and Sociology. The addition of the two new adjunct Research Scientists from the Cincinnati Children's Hospital and Medical Center, one a graduate of the Occupational Safety and Health Research program, increased the number of opportunities for such work and has opened new opportunities for student and faculty occupational health research. For example, a doctoral student studying postural load of nurses has been working with Dr. Daraiseh; Dr. Davis (Occupational Health

Nursing) and Dr. Daraiseh are preparing a pilot study of bio-indicators of stress and musculoskeletal disorders. This student will be completing her dissertation and she has been working with another doctoral student in ergonomics. A second doctoral student is completing a study of violence against personnel in a pediatric emergency room.

Interdisciplinary interaction was also fostered by providing support for trainees to attend research training courses and other programs and support for inviting outside research experts to present seminars and other training to trainees. These activities also resulted in the acquisition and development of new research skills which are described in the next section.

Research Skill Development

Interdisciplinary Research Training Support of Academic Programs included providing support for trainees to attend research training courses and other programs, support for inviting outside research experts to present seminars and other training to trainees.

An essential research skill which all investigators need to acquire and continuously update is that of successful grant-writing. The second Grant Writing Workshop was conducted with NORA support by the Pilot Research Project Program to improve the grant writing skills of ERC trainees and faculty and of other occupational health and safety related personnel from the institutions participating in the PRP program. This Workshop is described in more detail in the Pilot Research Project program report.

A Special Issue of "Theoretical Issues in Ergonomics Science", Vol. 7, Number 3, May-June 2006, *Taylor & Francis,* devoted to Safety and Health Engineering: Research to Practice, was edited by Drs. Shell and Genaidy of the OSHE program. More details are presented under "Products".

A number of special research methods training projects were undertaken. Among these were projects for: interdisciplinary ergonomics research skills, methods to investigate vibration damping of intervertebral segments in an animal model, methods for fungal spore identification.

Interdisciplinary Ergonomic Research Skills

This activity was a collaboration between the University of Cincinnati and Purdue University, a partitipating institution in the ERC Pilot Research Project Training Program. This research training was initiated during 2004-2005 and was completed during 2005- 2006. The structure of the training project involved having the professors at Universities of Cincinnati (Dr. Kermit Davis) and Purdue (Drs. James McGlothlin and Shirley Rietdyk) train students in their experimental procedures at the first session and then to have the students develop a training activity for the second session during which they could utilize their new skills in addressing a workplace situation with ergonomic problems. The focus of the research training exercise was to investigate the biomechanical and physiological responses that occur while handling beverage shells of different designs used in the beverage industry. Researchers from UC were responsible for data collection using the Lumbar Motion Monitor and those from Purdue collected data using a motion analysis system and heart rate monitor. This project enhanced the ergonomic research skills of trainees at the two institutions and will provide a good foundation for future

colaborations between the two institutions for NORA projects for which external funding can be pursued.

Methods to Investigate Vibration Damping of Intervertebral Segments

This training was conducted at the University of Waterloo. It involved learning how to perform a protocol for dissecting the C3/C4 and C5/C6 vertebral segments from a pig carcass, mounting them in fixtures in an Instron mechanical testing machine, attaching four accelerometers to the motion segment, loading the segment repeatedly until failure occurred, then dissecting and cleaning the motion segment to determine the type and location of failure. This training provided the opportunity to learn how the properties of the segment changed during repeated loading and near/after failure. One of the goals of the training is to develop a non-invasive method to identify when individuals are at risk of developing a low back injury. It was also useful in what is changing biologically during loading. This will be useful in aiding in the determination of when and to what level pain due to injury is sensed and how pain ratings or measures of biological pain responders can be used to also aid in the prediction of a low back injury.

Fungal Spore Identification

Two Environmental and Occupational Hygiene trainees attended a workshop on Fungal Spore Identification and Bioaerosol Sampling at Harvard University. The purpose of this course was to provide the students with a comprehensive knowledge of airborne pollen and spores, including identification and counting procedures. Skills were acquired to identify common outdoor and indoor genera of fungi and pollen**.** The training was also useful in helping to develop a better understanding of total exposure to these harmful environmental agents and to help develop sampling strategies for exposure assessment.

In addition, a doctoral candidate visited the NIOSH Pittsburgh research facility to learn new techniques for assessment of ergonomic exposures.

Enhancement of Pilot Research Project Program

The Pilot Research Project Program was enhanced through NORA support in several ways:

- Promotion of attendance at the annual Symposium through efforts of the Continuing Education program to publicize the program and to secure continuing g education credits for various disciplines.
- Development and distribution of a CD of proceedings of the Symposium.
- Improvement in quality of grant proposals through Grant Writing Workshop described elsewhere.

E. Program Products

Outreach for Research to Practice

- A report of the NORA Town Hall Meeting in Piqua, Ohio; which we helped to organize and conduct is available through the NIOSH website.

- A state wide conference on presenteeism was offered in conjunction with the Ohio Association of Occupational Health Nurses and faculty presented three of the conference sessions. Evaluations indicated that the conference was one of the best in the last 15 years, addressing contemporary occupational health issues.

Interdisciplinary Research Development

A number of manuscripts were developed and/or submitted and a number of research proposals have been developed and/or submitted/funded as has been indicated in the reports of the various ERC programs. For example, the products of the interdisciplinary research collaborations of occupational health nursing doctoral students with faculty in the College of Medicine, Engineering, Education and Sociology include the funding of five out of seven submitted intramural, interdisciplinary grants. Three students presented papers or posters of research in progress. One student published a paper on his research topic of incivility, and two other publications are in preparation.

Several outside occupational health and safety research investigators/practioners were invited to present seminars and interact with faculty and trainees. These visitors are sometimes hosted by an individual ERC program and sometimes by the ERC as a whole. In all cases their presentations are open to all ERC programs and others at the University of Cincinnati and nearby. The following ERC Research Seminars were presented:

2005-06 ERC Special Seminars

Date	Guest Lecturer(s)	Title	Host/Hostess
June 26, 2006	Dr. Ragnar Rylander Professor Emeritus University of Gothenburg, Sweden BioFact Environmental Health	Magnesium in Drinking Water and Cardiovascular Disease Risk: Epidemiological and Environmental Aspects	Tiina Reponen, Ph.D.
May 16, 2006	James K. Richardson, MD Associate Professor, Dept. of PM & R University of Michigan	Research Updates: Gait/Balance, Ulnar Neuropathy and Response Times	C. Sue Ross, MD, JD
March 29, 2006	Dr. Pierluigi Cocco Associate Professor Of Medicine Department Of Public Health Occupational Health Section University Of Cagliari, Italy	Lung Cancer Among Silica Exposed Workers: The Quest For Truth Between Chance And Necessity	Carol Rice, Ph.D., CIH

Research Skills Enhancement Efforts

A special issue of Theoretical Issues in Ergonomic Science (volume 7, number 3, May-June 2006) "Safety and Health Engineering: Research to Practice" was devoted to the results of a research to practice class developed with NORA support. This issue was edited by Drs. Richard L. Shell and Ash M. Genaidy of the Occupational Safety and Health Engineering program. Of the eleven (11) articles in this issue, nine (9) had an ERC trainee as the first author. Although most authors/co-authors were from OSHE, individuals from two other ERC programs were co-authors.

Pilot Research Project Symposium

A CD for the Sixth Annual Pilot Research Project Symposium held in October 2005 was developed and has been widely distributed.

F. Future Plans

Outreach for Research to Practice

- Local, state, national and international outreach activities described above are expected to continue and expand the impact of ERC research on the occupational health and safety.

- A special issue of the journal "Human Factors and Ergonimics in Manufacturing" will be prepared consisting of publications co-authored by Occupational Safety and Health Engineering faculty and students.

Interdisciplinary Research Development

The efforts underway during the past year to develop interdisciplinary research activities will continue during the next year. These activities are expected to result in the submission of a number of interdisciplinary research proposals involving faculty from each of the ERC academic programs as well as other investigators at the University of Cincinnati and elsewhere. For example, a project initiated earlier by Occupational Medicine faculty (Dr. C.S. Ross), related to research involving the Americans with Disabilities Act and issues for workers with disabilities, will be further developed with College of Law faculty and submitted to the National Science Foundation. Dr. Tiina Reponen (EOH) and Dr. Jones (Nursing faculty at Western Kentucky University) will submit a proposal to study respiratory protection among farm workers.

Research Skills Enhancement

A Workshop on Research Proposal Preparation is being planned for April 2007 for ERC trainees and junior faculty and for recipients of previous Pilot Research Project Training Program grants. Such training is increasingly needed as the competition for research support becomes increasingly competitive. It is expected that there will be about twenty (20) participants in this program.

Pilot Research Project Program Enhancement

The compact disk of the PRP Symposium proceedings will be developed using resources within the Department of Environmental Health in an effort to make the editing process more efficient. The expansion of the program to include two additional educational institutions in Ohio will be considered. Future pilot projects will include addressing the potential impact on occupational health and safety.

A. Program Title: **PILOT PROJECT RESEARCH TRAINING PROGRAM**

B. Program Director **Amit Bhattacharya, PhD, CPE**

C. Program Description

The Pilot Research Project Training Program at the University of Cincinnati was established on July 1, 1999 to provide timely support for training to all students in the many areas of occupational health and safety-related research including statistical and epidemiological aspects, sampling and analysis methods, comprehensive survey methods, evaluation of research design and results, and research approaches. In response to the NIOSH requirements, the Cincinnati ERC Pilot Program includes nine other academic institutes in the region. Many doctoral students receive additional training in such areas as experimental design and hypothesis development. Since the qualifying examination process for many doctoral programs often requires that candidates prepare research proposals, the Pilot Research Project Program provides an excellent opportunity to gain experience in this area which is vital for a successful research career. Students at collaborating institutions in programs, most of which do not currently have NIOSH training grant support are also eligible for the pilot project grants. Junior investigators at all collaborating institutions, and senior investigators seeking support for extending their research to occupational health and safety areas are also eligible to participate.

Pilot projects are intended to enable the following objectives:

1. Develop research expertise, capacity, and understanding in Education and Research Center research trainees and new investigators and within regional occupational safety and health research training programs.
2. Provide initial support for new occupational safety and health investigators to establish new areas of research that address National Occupational Research Agenda (NORA) topics.
3. Encourage investigators from other relevant research areas to apply their expertise to NORA topics.

Participating Institutions

As initially established, the University of Cincinnati PRP, in response to NIOSH guidelines, included three other universities in the region: Purdue University, University of Kentucky and Western Kentucky University. During the five-year competitive renewal of the PRP for July 1, 2000 to June 30, 2005 the program was expanded to include four other institutions: Central State University, Eastern Kentucky University, Kentucky State University and Murray State University. In 2004, two more regional universities were added: Bowling Green State University and University of Toledo – Medical Science Campus (formerly Medical University of Ohio). Two of the institutions are historically black universities (Central State University and Kentucky State University).

Responsible Conduct of Science Training

PRP Symposium

Last year's symposium was held October 20-21, 2005 here at the University of Cincinnati's Kettering Laboratory Kehoe Auditorium. We had 80 people register for the event. That year,

we had 2 keynote speakers (one for each day). They were Jean Grassman, PhD, Associate Professor and Deputy Chair-Health, Brooklyn College-CUNY, who spoke on, *"A Different Kind of Biomarker: Changes in Gene Expression After Exposure to Dioxins"*. The second keynote speech was given by Linda McCauley, PhD, FAAN, RN, Nightingale Professor of Nursing & Associate Dean for Nursing Research, University of Pennsylvania, who spoke on, *"Closing the Research Link: Farm Worker Pesticide Exposure, Biomarkers and Neurobehavioral Effects"*. In addition to the keynote addresses, there were 12 podium presentations and 10 poster presentations given by investigators from the various PRP member colleges and universities. Drs. Kermit Davis and Farhang Akbar, from the University of Cincinnati and University of Toledo – Medical Science Campus (formerly the Medical University of Ohio), respectively, served as our symposium moderators. The next symposium will be held, October 12-13, 2006 (*Please See PRP Attachment I).*

2006 PRP Grant Writing Workshop

In our concerted effort to build the grant writing skills of trainee and junior faculty, we facilitate an annual grant writing workshop on the University of Cincinnati campus. The first grant writing workshop was given last year (2005). Each PRP partner university is allowed to send 2 researchers to attend the 2-day workshop. We strongly encourage each university to send 1 doctoral trainee or junior faculty (up to the rank of Assistant Professor) with some exposure to occupational safety and health area and 1 senior faculty (Associate or Full Professor) with no prior experience in occupational safety and health research. The 2006 workshop was held April 3-4, 2006 (*please refer to PRP Attachment I*) at the Marriott Kingsgate Hotel located on the University of Cincinnati campus.

There were 21 people who registered for the workshop, of which 4 submitted proposals for 2006-07 grant year funding and 2 made presentations at the 2006 7th Annual PRP Symposium. The workshop participants represented the University of Cincinnati, Bowling Green State University, Western Kentucky University, Eastern Kentucky University, Purdue University and the Medical University of Ohio. Dr. Jack Kues, Assistant Senior Vice-President for Continuing Professional Development, Assistant Dean for Continuing Medical Education and Professor of Family Medicine served as a presenter on the "nuts and bolts" of grant writing for researchers and facilitator for the first day and Dr. Amit Bhattacharya, PRP Program Director, served as the facilitator for the second day. In response feedback from prior workshop attendees, we invited NIOSH representatives to present to our workshop participants about NIOSH programs and grant review/award/reporting procedures. Drs. Bernie Kuchinski, Linda Frederick (NIOSH-Atlanta office) and R. DeLon Hull, along with Mr. John Talty, provided excellent presentations in the areas of NIOSH Extramural Programs, working with Program Officers and the NIOSH grant application and review process on the second day. Dr. Joel Tsevat of the University of Cincinnati made a presentation on the NIH Roadmap. Drs. Sergey Grinshpun, Carol Rice and C. Scott Clark, all of the University of Cincinnati ERC, were able to provide insights from a senior researcher and/or study section members' viewpoint, served as panelists in a round table discussion. Participants were also allowed to network and ask additional questions on a one-on-one basis with all of the workshop presenters. The purpose of the presentations and Round Table Discussion was to familiarize participants with best use and practices of grant writing, the review process and key items to identify in a grant Request For Proposals (RFP).

Faculty participation

Faculty members representing all 10 universities participate in various aspects the PRP activities including, participation in the PRP Advisory Board, assist in review of PRP grant applications from the students and junior faculty, serve as mentors on the PRP grant applications for their advisees, encourage their students to develop research proposals for submission to PRP, assist in PRP symposium activities, participate in the annual grants writing workshop (see above section for details) and encourage collaboration among participating institutes for the development of multidisciplinary research project.

D. Program Activities and Accomplishments

The Pilot Research training Program (PRP) five year competitive renewal grant application was competitively reviewed by NIOSH in March 2005 and has been funded through 2010. Since the program's inception through the end of the 2005-06 fiscal year, 98 out of 116 applications projects have been funded totaling $443,893. Fifty-nine peer-reviewed articles and conferences presentations directly resulted from their PRP pilot research grant activities. During the 2005-06 fiscal year, we conducted two (2) Request For Proposals (RFP) rounds for the Pilot Research Project. We received 13 applications for the first round and 9 for the second round. We awarded 17 applications totaling $93,043 combined from both rounds (*please refer to PRP Attachment I*). Since our last reporting period, there have been 16 peer-reviewed articles and conference presentations directly resulting from PRP pilot research grant activities (*please refer to PRP Attachment I*). As a result of $443,893 in PRP grant support, many awardees have garnered additional grant support from agencies and programs independent of PRP, such as, NIOSH, USDA, CDC, et cetera in the amount of $3,531,378. This reflects a return on the investment equaling 8:1. Additionally, PRP also resulted in bringing in 15 new investigators from other fields of expertise to the area of occupational safety and health research.

Research capabilities at collaborating institutions

As indicated in our 5 year competitive renewal grant, the research collaboration continues between Dr. Kermit Davis (UC) and Drs. Jim McGlothlin and Shirley Rietdyk of Purdue University as well as graduate students from both schools to perform a project utilizing the expertise of both universities and allowing interaction between researchers and students. The focus of the project is to investigate the biomechanical and physiological responses that occur while handling beverage shells of different designs used in the beverage industry. Both groups have had the opportunity to learn about and use the other university's equipment through training in October, 2005.

Research projects completed that had significant trainee involvement

All PRP grants require participation by the PhD students as well as some Master's students working under the mentorship of a faculty.

E. Program Products

Please refer to the Attachment section

F. Future Plans

The 2006 Seventh Annual PRP Symposium is scheduled for October 12-13, 2006 at the University of Cincinnati. Keynote speakers have been already identified and all symposium

related activities are on schedule. During the upcoming symposium PRP Advisory Board will discuss the agenda for 2007 Grant writing workshop. The agenda will include items such as review for completeness of PRP awardees grant application who have taken the grant writing workshop, and identify what changes (if necessary) are needed and how the workshop can be made more effective. The evaluation form currently used for grant writing workshop will be reviewed by the Board and necessary changes will be made. The PRP Advisory Board will also discuss the requirement for PRP awardees (and their mentors) to explore the IMPACT of their research findings in Specific Improvements in OS&H. Also discuss the requirements of PRP awardees (along with mentors) to explore new project ideas dealing with r2p.

A. Program Title: **ENVIRONMENTAL AND OCCUPATIONAL HYGIENE**

B. Program Director: **Carol Rice, Ph.D., CIH**

C. Program Description

The educational goal of the program is to provide an exemplary academic program for students that will enable them to become leaders in the field of environmental and occupational hygiene. As part of this program, students engage in ongoing state-of-the-art faculty research and service. The educational program provides a curriculum that enables graduates to achieve the following:

1. Demonstrate a high level of technical and scientific competence in the anticipation, recognition, evaluation and control of occupational and environmental exposures, including the design and development of long-range goals and programs. This may include participation in global professional activities.

2. Solve real-world problems by combining observation, evaluation of the literature, measurement and other data collection and analysis of data.

3. Communicate effectively regarding potential hazards, risk reduction approaches and required actions within the health and safety team, with varying levels of organizational management and other affected stake-holders.

4. Apply the professional code of ethics in all aspects of their practice.

5. Demonstrate an appreciation for the limits of their graduate education and experience by participating in the continuous process of professional development, including continuing education and professional certification.

All trainees participate in the University-mandated training relative to the ethical conduct of their research, if animals or humans are involved. In addition, two courses are required: Academic Conduct, Ethics in Research.

Detailed course Goals and Outcomes formats for each course allows students to better understand the goals of the course and the specific educational outcomes that are expected. Outcomes are further refined to distinguish between expectations of knowledge or skill gain or development of appropriate professional attitudes. All seven full-time faculty teach required courses; their efforts are supplemented by two adjuncts who teach required courses and two other adjuncts who provide major input to required courses. The curriculum includes a required thesis at the M.S. level, and a dissertation for the Ph.D. A complete listing of courses is shown at www.eh.uc.edu/ih.

D. Program Activities and Accomplishments

Progress towards goals and objectives: During 2005-06 the faculty, students, staff, alumni and advisory board members contributed to the preparation of the ABET Self-study. This provided an opportunity to more fully describe the program elements and to initiate new assessments to better document successes and identify shortcoming.

We have documented success in accomplishing our Measurable Objectives in the areas of Teaching and Professional Development (this includes: high rate of feedback on course evaluations and response by faculty; professional development activities of students measured by attendance at meetings, membership in professional organizations and tracking of CIH exam completion), Research (this includes: faculty publication goals for student research and annual reviews), Service (this includes: CE course participation, outreach, consultations and other service), and Program Development (this includes: graduate activity in the major aspects of practice described in our educational goals, structured recruiting plan, increased alumni communication, response to any program critiques).

Our alumni survey documented that graduates have high levels of activity (greater than 5 on a 7-point scale) and similarly high self-efficacy (confidence to do the activity) for the first four educational goals, shown above. Eighty percent of the respondents documented participation in at least one continuing education activity during the previous year, indicating that most understand the limits of their education (educational goal 5). Of those seeking CE, more than one-third listed a "global issue" in the topics, consistent with educational goal 1, above. We are tracking CIH exam successes. Seven of the 20 graduates since 2000 are eligible; one successfully completed the exam this year.

Trainee honors and awards: Two Ph.D. students received important awards this year. Susan Kotowski, MS, and a Ph.D. candidate received the Ryan Fellowship from the University of Cincinnati, the International Society of Biomechanics Matching Dissertation Grant award, American Society of Safety Engineers Foundation/Ford Motor Company Scholarship, membership in the Human Factors and Ergonomics Society with honors, University of Cincinnati Summer Research Fellowship, and a University of Cincinnati fellowship for Preparing Future Faculty. The dissertation research work of Shu-An Lee, Ph.D. (with faculty members Dr. Tiina Reponen and Sergey Grinshpun) was recognized with the John M. White award at the 2006 AIHce for the best respiratory protection paper published in 2005.

Faculty honors/awards/special appointments: The full-time faculty were recognized for their work throughout the year. Examples for each follow:

- **Dr. Scott Clark** received the 2006 Amicus Poloniae Award from the Republic of Poland at the AIHA Business meeting. Presented to recognize "extraordinary accomplishments in development of Polish-American relations", the award honored Dr. Clark's ten years of support in the development of the profession in Poland.
- **Dr. Kermit Davis** received the International Society of Biomechanics Promising Young Scientist Award and the Hallman Visiting Professorship at the University of Waterloo.
- **Dr. Amit Bhattacharya** was elected a Fellow in the inaugural class of the Biomedical Engineering Society and served as a reviewer for several NIOSH study sections and panels.
- **Dr. Sergey Grinshpun** was guest editor of a special issue of the Journal of Aerosol Science, Measurement and Characterization of Bioaerosols. He served as session co-chair at European Aerosol Conference in Ghent, Belgium, was a session chair at the annual meeting of the American Association for Aerosol Research and was a session co-chair,

reviewer and presenter at the 10th International Conference on Indoor Air Quality and Climate, Beijing. Dr. Grinshpun served as a doctoral thesis examiner at Griffith University, Brisbane Australia.

- **Dr. Tiina Reponen** has been elected to Board of Directors, American Association for Aerosol Research. She served as an opponent for a doctoral defense at Helsinki University, Finland, and was an invited speaker at INRS (French equivalent of NIOSH) in Nancy, France.
- **Dr. Carol Rice** served as an ad-hoc member of the NIOSH Safety and Occupational Health study section. She was a co-arranger for Living in a Chemical World III, Bologna Italy and is the Convenor of the annual meeting of Occupational Hygiene Women Faculty.
- **Dr. Glenn Talaska** has been appointed to the International Scientific Advisory Group to plan the International Society for Biological Monitoring 7th Meeting to be held in Peking China, October 2007.

Trainee dissertation and thesis titles: Four Ph.D. and two M.S. degrees were awarded during the year. Titles follow:

- Impact Of Arsenic On Benzo(A)Pyrene-DNA Binding-Role Of Gluthathione—Jay Vietas, Ph.D. (Talaska, chair)
- Indoor Mold Exposure And Its Relationship With Wheezing In Infants--Seung-Hyun Cho, Ph.D. (Reponen, chair)
- Aerosolization Of Fine Particles And Microbial Contaminants From Metalworking Fluids Contaminated With Microorganisms—Hongxia Wang, Ph.D. (Reponen, chair)
- Criteria For Evaluating An Occupational Safety And Health Program—Steve Wurzelbacher, Ph.D. (Bhattacharya, chair)
- Use Of Air Dispersion Modeling To Estimate The Time Potentially Available For Emergency Response Action Needed To Protect Public Safety From Chemical Releases—Chris Adkins, M.S. (Clark, chair)
- Estimating Historical Trichloroethylene Exposure In A Uranium Enrichment, Gaseous Diffusion Plant—Adriane Moser, M.S. (Rice, chair)

New faculty positions: Jay Jones, CIH was appointed adjunct Associate Professor. He is responsible for the planning and conduct of the two-quarter course Identification of Potential Workplace Exposures during which students conduct walk through assessments, describe observations and propose strategies to evaluate potential hazards.

New courses or content: The content of two courses has been enhanced to include topical areas: Principles of Occupational Exposure Assessment, 26-EIH-707 (Talaska) includes a 1.5 hour lecture on Control Banding; Hazardous Materials Management, 26-EIH-834 (Clark) includes coverage of the National Incident Management Plan and requirement that students successfully complete the on-line course, IS-700 in the National Incident Management System. The Graduate School approved a new course, Workplace Exposure Measurements—follow-up, 26-EIH-971 (Rice) during which students review their graded comprehensive survey reports from Evaluation of Workplace Exposures, 26-EIH-775 (Rice), and cover advanced topics including an ethics scenario.

Trainee recruitment, including diversity: In 2004 the program implemented a structured recruitment plan after consultation with professional recruiters and a self-study of the market. The plan describes a student-centered approach with annual visits by teams of two current students or recent graduates. Schools in the region include: University of Cincinnati, University of Findlay, Bellarmine University, Western Kentucky University, Eastern Kentucky University, University of Dayton, Central State University and Wittenberg University. We maintain a recruiting effort by "mail" with Clarkson University in Potsdam, NY, due to a history of past applicants and have established a relationship with Xavier University here in Cincinnati. The recruiters have told us that 6 years of consistent and repetitive implementation is needed to see benefits. At the end of two years of implementation, we can report that of the applications received this year for the largely from the targeted schools. Of those accepted for the 2006-07 year, 60 percent are from these schools. One serious inquiry was received from Central State University, largely minority institutions, but the application was not completed; this is an improvement from no contacts, however.

E. Program Products

Publications and Presentations: Appendix C

Conferences/symposia sponsored: The program hosted a joint meeting with the Ohio Valley AIHA section in March 2006, in the Howard Ayer Computer Laboratory and adjoining student room. Students had opportunity to discuss their program with local hygienists and present their research. Students preparing to present posters or platform talks at national meetings used this as an opportunity to get feedback by posting drafts or providing overviews verbally.

Continuing Education courses faculty participated in: Faculty continued to support the dissemination of information, as follows: Dr. Kermit Davis participated in Training in the Art of Postural Assessments: Basics and Hands-on Application in June presented to the Ohio Bureau of Workers' Compensation by being a speaker and conducting a hands-on lab for a total of 5 hours; Dr. Sergey Grinshpun was an instructor in the AIHA-sponsored Nanotechnology Symposium at the 2006 AIHce; Dr. Glenn Talaska participated in Industrial Toxicology presented in September by the UC ERC by providing a 1.5 hour lecture on Biological Monitoring.

Successful R2P projects:

- Work by Dr. Scott Clark on the continuing use of lead in paint in Asia has resulted in international interest, including invitation to meet with international officials to devise plans to ban these products.
- A project titled "Criteria for evaluating an occupational safety and health program" designed as the dissertation research of Steve Wurzelbacher under the direction for Dr. Amit Bhattacharya showed that both "subjective" and "objective" types of injury/illness benchmarks or metrics can be predictive of future economic losses. This indicates that the regular tracking/trending of past loss outcomes and the regular subjective auditing of loss prevention and reduction efforts within a company are useful processes. As a direct result of this research, an employer now uses both types of benchmarks to develop more robust, data-driven safety and ergonomic plans that are reactive to past exposures and proactive in identifying system deficiencies that could contribute to future losses.

- Work directed by Dr. Sergey Grinshpun has resulted in new methods to counteract terrorism at the Department of Homeland Security.
- A continuing project to train site workers and emergency responders through the NIEHS supported Midwest Consortium for Hazardous Waste Worker Training directed by Dr. Carol Rice documents that 60% of site workers and 81% of emergency responders completing refresher training in 2005-06 changed their work behavior to do a task more safely.

Research projects completed that had significant trainee involvement: Students had substantial opportunity to participate in funded research, including: A novel post-menopausal osteoporosis screening tool, funded by NIAMS and directed by Dr. Bhattacharya included substantial involvement by Susan Kotowski and Chun-Hui He; Training in interdisciplinary ergonomic research: collaboration between University of Cincinnati and Purdue University, funded by NORA was completed by Dr. Kermit Davis with involvement of Matt Hammer, Xu Zhang, Qiang Zheng and Susan Kotowski; Biomechanical assessment of mining bolting machine, funded by NIOSH Pittsburgh was completed by Susan Kotowski, under the mentorship of Dr. Kermit Davis. Nanoliter bio-agent autonomous networked detectors: development and validation of a new bio-detection method, funded by the US Department of Homeland Security and directed by Dr. Sergey Grinshpun had substantial involvement by Taekhee Lee; Evaluation of novel air purification techniques, funded by EcoQuest International and directed by Dr. Grinshpun had substantial involvement by Taekhee Lee. Cincinnati Childhood Allergy and Air Pollution Study, funded by NIEHS and with a substantial component directed by Dr. Reponen has involved Seung-hyun Cho and Yulia Iossifova; a Pilot demonstration to investigate work practices to reduce exposure to mold an endotoxin during Katriana cleanup directed by Dr. Tiina Reponen involved Carlos Crawford and Sung-Chul Seo; Effects of diet on DNA damage in heavy smokers, funded by the World Cancer Fund was completed by Dr. Glenn Talaska with involvement of Ph.D. student Jay Vietas.

Unique Training courses: Students completed Community Emergency Response Training. IH students included Custodio Muianga, Matt Hammer, Cara Pennline, Carlos Crawford, Susan Kotowski, Yulia Iossifova and Taekhee Lee.

F. Future Plans

During the coming year, the faculty will further refine the content of classes by analysis of the balance of knowledge, skills and attitudes in relation to educational outcomes. We will continue the recruiting plan and initiate contact with alumni regarding completion of the CIH exam.

A. Program Title: OCCUPATIONAL HEALTH NURSING (OHN)

B. Program Director: L. Sue Davis, Ph.D., RN

C. Program Description:

The goals of the OHN MSN and PhD programs are:

1. Excellence in OHN academic (MSN) and research training (PhD) through continuous internal and external evaluation of students, faculty, research, and curriculum; and through continued maintenance of strong community OHN relationships.
2. Increase enrollment in masters and doctoral study in OHN.
3. Increase visibility within the University and ERC through interdisciplinary interaction; and within the College by engaging all faculty members with an occupational health focus or interest to present lectures in OHN courses and mentor masters and doctoral students in research.
4. Continue to develop research foci in workplace violence and work-related musculoskeletal disorders; and mentor junior faculty and students in OH&S research.

Faculty participation

Faculty has functioned as a team for eight years, and has knowledge and skills essential for preparing advanced practice occupational health nurses and researchers: occupational nursing, epidemiology, policy, ethics, administration, and strong research. The Dean and Associate Division Deans are supportive of the OHN team efforts to make changes for the benefit of the program. We have a wide range of adjunct professors and community partners who serve as preceptors and offer research and practice opportunities.

Responsible conduct of science training

All graduate students are responsible for understanding and complying with responsible conduct of science. As a part of the course work, students are required to take the CITI course in the protection of human subjects. Additionally, doctoral students receive more in-depth content in the Pro-Seminar courses, are tested over the content in the preliminary examination following completion of foundational doctoral courses, and are supervised closely by faculty in their compliance with the College of Nursing Standard Operating Procedures for the Conduct of Research. PhD students are also required to take the HIPAA, Post Approval Monitoring, and Compliance Training courses.

Curriculum: Master's

Clinical Nurse Specialist option. The master's OHN program is five quarters in length; and consists of 64 quarter credits. The focus is development of an OHN manager. The curriculum is shown in Appendix A: Program Curricula. Three OHN courses are web-based: Introduction to Occupational Health Nursing (29ANCH810); Managing Occupational & Environmental Diseases and Injuries (29ANCH811); and Managing Occupational Health Programs (29ANCH813). Previously existing web-based courses are Epidemiology (29ANCH851), Health Planning (29ANCH814), and Data Base Management (29NURS819). The statistics and research on-line courses are in pilot testing. Moving to web-based courses allows greater access for nurses wanting to complete the MSN or Post-Masters OHN Certificate. Student evaluations show that live-time virtual classroom improves student/faculty and student/student interactions;

however, students prefer a blend of classroom and electronic learning. The College of Nursing is developing core masters courses for a web-based format. As this occurs, and as funding becomes available, we will work toward developing a fully web-based OHN master's program that includes interdisciplinary interaction of faculty and students. Contacts have been made with the Department of Environmental Health to discuss development of an on-line toxicology course.

Nurse Practitioner (NP) Option

Students interested in learning OHN nurse practitioner skills have two options. In the first option, students complete the OHN master's degree and then an FNP post-master's certificate of 38 credits. In the second option, students combine their OHN master's with the NP master's. The OHN and FNP Program directors jointly plan a program of study that includes core courses, specialty and interdisciplinary courses. Practicum experiences incorporate FNP, occupational health and safety experiences. Option one can be completed in three additional quarters. Option two requires 25 additional quarter credits and can be completed in two additional quarters. Students are eligible to take the ANCC certification examination for family nurse practitioner.

OHN Post-Master's Certificate

This program is for nurses with an MSN in another nursing specialization. The certificate program is 30 quarter credits and includes occupational health nursing, management, and environmental health. Graduates are prepared to practice in occupational health and safety environments, with the same skills as the clinical nurse specialist. We currently have one student in the program and Dr. Susan Jones from Western Kentucky University indicates that there is significant interest from students in their nursing master's program.

Curriculum: Doctoral Program (PhD)

The Doctor of Philosophy (PhD) prepares nurse scientists in clinical and health care systems research. Students take research, theory and policy courses as well as an individualized program of courses pertinent to their area of research interest. Recent examples of study emphasis are workplace behavioral change, respiratory disorders, musculoskeletal disorders and workplace violence. Post-baccalaureate students pursuing the PhD degree complete the Master's core requirements and take 45 credit hours of Master's level course work in occupational health nursing. MSN to PhD students take electives in OHN and select the majority of cognate credits from courses in the Department of Environmental Health, Occupational Medicine, or Industrial Engineering.

Students develop their research focus, by working with established interdisciplinary research teams in the College, ERC, University, NIOSH and industry. Procter and Gamble, NIOSH, Kellogg Foundation and the Iowa Pork Association have recently supported doctoral student research. Students are expected to complete pilot studies or work on established studies as they progress through their program. Examples of pilot projects include risks related to employment in hospital emergency departments, health survey of construction workers exposed to silica, use of personal protective measures by migrant workers, changes in life-style behaviors related to an employee incentive plan, respiratory disorders in swine farmers, safety culture on hospital units, and organizational factors contributing to work-related musculoskeletal disorders in hospital personnel.

D. Program Activities and Accomplishments

Progress Toward Goals And Impact On The Community

The program continues to maintain an enrollment of five master's students; however the number of doctoral students increased from two in AY05 to four in AY06. Master's students contributed significantly this last year to the occupational health of our community. They were responsible for organizing, implementing and evaluating health fairs at two manufacturing sites, thus allowing the OHNs to expand health promotion activities to approximately 800 employees. Another project included the evaluation and cost-effectiveness of an on-site occupational health program. The results are now being used to determine whether or not the program should be extended nationally. Other projects were evaluation of a medical waste disposal process in which recommendations were made to the hospital health and safety department; and a project involving assessment of job hazards in a waste recycling plant. Again, recommendations were made to the owners of the recycling plant. Partnerships with the Ohio American Cancer Society, the Health and Productivity Institute of the Tri-C Business College, and the Governor's Council for Healthy Ohioans were developed to enhance development of workplace health promotion and risk reduction activities in Ohio and students are invited to join in statewide occupational health activities. Research efforts of the PhD students continues to increase (see Table 1), and faculty are active in grant submissions, with 25 extramural research and program grants submitted in the 2006 academic year for a total of $14,418,392 (See Appendix C: Grants Submitted).

Trainee Honors, Awards, Scholarships

Tracey Yap, Medtronic Academic Scholarship, American Association of Occupational Health Nurses, $3,000. Sue Davis, mentor, March, 2006.

Jie Chen (2005). Honor a nurse program, Nurse of the year award, Channel 12 News, Liz Bonis, reporter, December 27, 2005.

Table 1: Trainee grants

Grant/Project; PI & Faculty Mentor	Funding Source	Status
Workplace incivility among nursing staff and losses in productivity (Hutton; Mentor: Gates)	Pilot Research Project grant, U.C. Education and Research Center, National Institute for Occupational Safety and Health	Funded
Trunk postural load in nurses (Chen; Mentor: Davis)	Pilot Research Project grant, U.C. Education and Research Center, National Institute for Occupational Safety and Health	Funded
Trunk postural load in nurses (Chen; Mentor: Davis)	University of Cincinnati Graduate Student Summer Fellowship	Funded
Tailored Messages and their Effect on Intentional Physical Activity (Yap, T; Mentor: Davis)	Pilot Research Project grant, U.C. Education and Research Center, National Institute for Occupational Safety and Health	Funded
Energy Expenditure, Heart Rate, and Perceived Physical Exertion in ER Nurses: A Comparison of A 12- and 8-hour Day Shift (Chen, J; Mentor: Davis)	Pilot Research Project Grant, U.C. Education and Research Center, National Institute for Occupational Safety and Health	Funded
Violence against nurses in pediatric settings (Gillespie, G; Mentor: Gates)	Pilot Research Project Training Grant, U.C. Education and Research Center, National Institute for Occupational Safety and Health	Pending

Faculty honors, awards appointments

- **Bonnie Brehm**, Member Merit Award, Ohio Dietetic Association, for commitment and meritorious service and important/creative contributions toward the achievement of the strategic plan, Columbus, OH, May, 2006.
- **Donna Gates**, Presidential Award for Excellence, University of Cincinnati, Cincinnati, OH, May, 2006.

Trainee Theses And Dissertations

No doctoral students graduated during the 2006 academic year.

New Faculty Positions

Jane Christianson, RN, MSN, a graduate of the OHN master's and a former member of the OHN Advisory Board was hired as a faculty member. She is teaching community health nursing at the undergraduate level and supervising undergraduates in occupational health and safety field experiences. Under Ms. Christian's supervision, students conduct employee and family health fairs, employee health screenings and conduct health promotion activities.

Trainee Recruitment And Diversity Efforts

The College has a strong recruitment plan, with an emphasis on minorities. Our recruiter, who is of a minority, uses a wide a variety of recruitment methods such as one-to-one, group and electronic communication. Faculty members are included in all recruitment efforts. Out of 356 graduate students, 22% are male and 20% are minorities. In FY06 three out of five MSN students were minority and two of the four PhD students are male, and one is a minority. Students in the MSN-Accelerated program and RN to BSN program are targeted in recruitment efforts. Five recent OHN graduates came from this group. Informational sessions are held for graduating seniors from UC and regional universities and colleges. The College also advertises in local newspapers, nursing recruitment circulars, targeted mailings, and at professional meetings and conferences. Lastly, program inquiries are followed up with personal communications from a faculty member.

E. Program Products

Publications: See Appendix C

Conferences/Symposia

The Occupational Health Nursing in partnership with NIOSH-ERC Continuing Education and the Ohio Association of Occupational Health Nurses sponsored the Ohio Association of Occupational Health Nurses State Conference, "*Presenteeism: The Newest Variable in the Productivity Equation"* on March 17-18, 2006. Three of the conference sessions were presented by OHN faculty. The conference was evaluated as one of the best conferences in over 15 years. Attendance exceeded expectations and was the first conference in several years to make a profit. Students were involved in the planning and implementation of the conference and presented evidence-based research posters (R2P) on workplace violence prevention strategies, business benefits of transitional work programs, and strategies to prevent injuries from sharps in operating room personnel.

Nursing also participated in the planning and presentation of the conference *Workplace Health, Wellness, and Safety: Evolving Issues,* September 23-24, 2005 in conjunction with the Western Ohio Occupational & Environmental Medical Association, Tri-State Occupational Medical Association, Southwest Ohio Occupational Health Nurses Association, Cincinnati NIOSH Education & Research Center Continuing Education Program

Unique Training Courses: *Doctoral Student and Faculty Development Nursing Research*
During the 2005-2006 academic year four academic courses for doctoral students, doctoral mentors and faculty were offered through the support of the Institute for Nursing Research. These courses included: 1) Fundamentals of Data Management and Analysis; 2) Interpretive Methodologies for Health; 3) Motivational Interviewing: Theory, Practice, and Research for Health Behavior Change; and 4) Grant Writing Workshop. Approximately 25 faculty and graduate students participated in the offerings. These offerings provided an outstanding opportunity for doctoral students and faculty to interact and continue development of research opportunities. Drs. Gates, Davis, and doctoral students were actively involved in these courses and potential research projects were identified. These courses will be offered again every year of every other year depending on demand.

Other Research Training Events

a. Update on New IRB Policies and Procedures, Carol Fabby, Program Director, Institutional Review Board, January 9, 2006
b. Creating and managing a grant budget, Tom Kelly, Lynn Sommers, Patrick Clark, Rebecca Bogart, and Tammy Mentzel, April 14 and May 3, 2006

G. Future Plans

There are two areas for future plans:

1. Increase recruitment efforts for MSN students to maintain a minimum of six full-time and four to six part-time students.
2. Work with the Department of Environmental Health to establish an on-line toxicology course and begin working toward putting one other interdisciplinary occupational health and safety course on-line. The goal is to increase enrollment in the distance learning occupational health and safety courses. The Colleges of Nursing and Medicine are collaborating on this initiative and have designated resources to assist in goal achievement.

A. Program Title: **OCCUPATIONAL MEDICINE**

B. Program Director: **Clara Sue Ross, MD, JD**

C. Program Description

The Occupational Medicine Residency Training Program continues to focus on recruitment of highly-qualified residents into the program, ongoing refinement of clinical, academic and practicum training opportunities and faculty participation in outreach activities. The program's objectives are: (1) To continue to offer a residency program that offers flexible, yet focused, high quality academic, clinical and research training; (2) To focus on occupational musculoskeletal disorders, in regard to prevention, clinical evaluation and treatment, through ergonomic and physical medicine and rehabilitation and independent medical evaluation opportunities; (3) To expand training in medico-legal affairs, and the interfaces between clinical practice and regulatory issues; (4) To continue to encourage research training and pursuit of academic careers by program graduates, and provide additional funding and encouragement in support of research training; (5) To continue to develop cooperative arrangements with industries and state and federal institutions to broaden the funding support for the training program, while simultaneously enhancing the clinical practicum training; (6) To utilize the competency-based evaluation program to assure optimally personalized and complete training.

The curriculum for the program consists of a combination of academic coursework, clinical rotations, practicum experiences and completion of a Master of Science project. Required academic courses include Epidemiology, Biostatistics, Basics of Occupational Medicine, Basics of Environmental Medicine, Occupational Health Management, Lung and the Environment, Environmental Health Seminar, Design and Management of Field Studies, Toxicology, Principles of Ergonomics, Medicolegal Skills, Survey of Public Health and Occupational Health, Hygiene & Safety Workshop. Clinical rotations include general occupational medicine, occupational pulmonary, occupational dermatology and various clinical electives. Available practicum experiences are varied and include rotations at NIOSH, OSHA, ATSDR, Bethesda Care, Procter and Gamble, Hillenbrand and University Health Services. Occupational Medicine Residency Training Program faculty members provide clinical and academic training for the residents and serve as academic and research advisors. Instruction in the responsible conduct of science includes a required course, Design and Management of Field Studies, and joint resident-faculty journal clubs held on a regular basis. The Master of Science research project completed by the residents is supervised by program faculty. Residents and faculty engaged in research complete University of Cincinnati online modules for research training. The program also has a number of volunteer faculty members who assist with the residents' academic and clinical training.

D. Program Activities and Accomplishments

The program's progress towards its outreach goals and objectives includes faculty participation in occupational health and safety continuing education efforts, lectures and consultations. The program's objectives have been advanced through the addition of an occupational medicine faculty member, Dr. Amy Rohs, and the recruitment of additional volunteer faculty members to serve as members of the Residency Advisory Committee and as clinical preceptors for residents' clinical occupational medicine training. Dr. Rohs, a NIOSH ERC-supported occupational

medicine trainee, joined the faculty in December 2005 and will focus her efforts on occupational pulmonary research and clinical issues. New training content offered included a new course, Special Topics in Preventive Medicine, developed by Dr. Ross. The course covers a number of important topics covered by the residents' board-certification examination, including food and water safety, travel medicine, immunizations, health and wellness programs, patient safety and disaster preparedness. Resident professional development goals met included the enrollment of residents in professional occupational health and safety groups and support of their attendance at regional and national occupational health conferences.

Dr. Lockey received a Presidential appointment to serve on the National Advisory Board on Radiation and Worker Health. Dr. McKay was one of the recipients of the American Industrial Hygiene Association's John M. White Award for their November 2005 publication, "Respiratory Protection Provided By N95 Filtering Facepiece Respirators Against Airborne Dust and Microorganisms in Agricultural Farms".

Trainee Dr. Michael Bledsoe completed his thesis, "Thyroxine and Free Thyroxine Effects in Workers Occupationally Exposed to Inorganic Lead", in conjunction with NIOSH personnel.

Ongoing recruitment efforts during 2005-06 resulted in the recruitment of one resident into the program in September 2005 and the recruitment of two other residents who began training on July 1, 2006.

E. Program Products

Dr. Ross and Dr. Gates (from the Occupational Health Nursing Program) had an article based upon their work from an ERC-funded project related to workplace violence in emergency department settings accepted for publication.

Dr. Ross served as President of the Western Ohio Occupational and Environmental Medicine Association, a component of the American College of Occupational and Environmental Medicine Association. She assisted in planning the group's annual 2-day educational conference held in September 2005 in conjunction with Dr. Jarrell. The two-day conference included presentations on workplace health and wellness, medical review officer and Department of Transportation driver issues, beryllium update, and an ATSDR presentation on asbestos in Libby, Montana. Dr. Lockey provided a lecture for the conference on "Recognition and Evaluation of Occupational Lung Disease".

Occupational faculty members have provided consultations on a wide variety of clinical issues, including bloodborne pathogens and needlestick injuries in healthcare settings and evaluation of potential worker exposures at an aluminum mining site.

F. Future Plans

Dr. Ross is working with Dr. Jarrell to develop a conference on occupational and environmental medicine for primary care providers to be held in 2007. The program faculty will continue to work with Dr. Jarrell to develop two web-based occupational medicine courses.

Program curriculum updates in the future will include revisions to the Toxicology and Survey of Public Health courses in response to resident input. Additional volunteer faculty members will provide more clinical education for the residents in the areas of occupational musculoskeletal disorders and independent medical evaluations. The program will continue to develop further collaboration with the Medical Toxicology program at the University of Cincinnati and with the local medical toxicology community. The program residents and faculty have been invited to participate in a yearlong journal club during 2006-07 regarding occupational epidemiology with local NIOSH personnel. Dr. Les Yee, a volunteer faculty member and Procter and Gamble medical director, will be working with the program to develop additional lectures on corporate occupational medicine. Dr. Anne Like, a volunteer faculty member who is a program graduate and previous ERC trainee, is working with Dr. Ross to develop a hospital/medical center employee health practicum experience.

The program resides in the Division of Occupational and Environmental Medicine. Dr. Lockey stepped down as Division chair in 2005 and the Department of Environmental Health has instituted a national search for a new division chair. Dr. Lockey will continue with his ongoing clinical and research programs.

The program will continue to track its graduates' progress in occupational medicine board examination testing. Two recent resident graduates took the examination and are awaiting their results. It is anticipated that two additional resident graduates will take the board examination in 2007.

The program will continue its efforts to develop additional sources of funding for the program, including its Channing Meyer Memorial Fund, to support the residents and faculty in the program.

A. Program Title: OCCUPATIONAL SAFETY AND HEALTH ENGINEERING

B. Program Director: Richard L. Shell, Ph.D., PE

C. Program Description

The Occupational Safety and Health Engineering (OSHE) program encompasses a wide range of University of Cincinnati (UC) courses and faculty. The majority of courses are taught by faculty from the colleges of Engineering (COE) and Medicine through the departments of Mechanical, Industrial and Nuclear Engineering (MINE) and Environmental Health (EH). OSHE has been a NIOSH ERC sponsored multi-disciplinary program since 1987. The MINE Department has offered safety engineering courses at the graduate level since 1975.

The primary objective of the OSHE research and training program is to provide graduate engineers with specialized courses and experiences that will enable them to become practicing safety and health professionals or researchers in the field. Additionally a secondary objective of the program is to provide exposure to and training in occupational safety and health for engineers in other engineering disciplines, such as Civil and Environmental, Mechanical, and Biomedical Engineering, who should be aware of and include safety and health considerations in their work conduct.

The OSHE program core and supporting faculty are outlined in Attachment 7a-1. The curriculum includes a combination of science and engineering. Attachment 7a-2 lists the required MS core courses and the assigned faculty. A curriculum change was recommended by the OSHE Advisory Board to allow an additional mathematics or technical elective for the program. The faculty reduced the core requirement from 30 to 27 credit hours by moving the Basis of Occupational Medicine (2 credit hours) and General Occupational Medicine Clinic (1 credit hour) from the core to commonly elected courses (Attachment 7a-3), and adding 3 credit hours of mathematics or technical elective (Attachments 7a-3 or 7a-4).

The program of study for the MS degree with Thesis option and Non-thesis option is shown in Attachments 7a-5 and 7a-6 respectively. Attachment 7a-7 depicts the requirements for admission into the MS program for those students without a BS degree in engineering. Attachment7a-8 is an example program of study for the PhD assuming completion of the MS as shown in Attachments 7a-5 or 7a-6.

D. Program Activities and Accomplishments

One of our measures of performance is the number of quality students in the program (including NIOSH Trainees). During 2005-06, 13 MS and 8 PhD students were enrolled. In addition, 55 senior undergraduate, 3 MS and 2 PhD students not in the OSHE program enrolled in one or more safety and health engineering courses. During this time period, three MS and two PhD students graduated. All but one MS student were NIOSH Trainees. For the first time one of the MS graduates majored in Civil Engineering with emphasis in Construction Management.

The American Society of Safety Engineers (ASSE) Student Section Southwestern Ohio Chapter was charted August 31, 2004 (Dr. Shell serves as Faculty Advisor and Dr. Genaidy is the Co-Faculty Advisor). Since that time the student membership has made excellent progress and

accomplishments. For example, the Chapter officers and other members attended the First Annual National Future Safety Leaders Conference held in Cleveland 2005, and five students have registered to attend the 2nd Annual Conference to be held at the Hilton Hotel in St Louis MO November 2-4, 2006. During 2005-06 the Student Section Newsletter was established. An example of excellence, two of the OSHE students, Farman Moayed and Tushyati Maudgalya, were awarded ASSE $1,000 scholarships. Both Farman and Tushyati are members of the Student Section Southwestern Ohio Chapter. The awards are highly competitive nationally and indicate high professional recognition. Lastly, Dr. Genaidy was named Fellow of the Ergonomics Society (UK) during 2005-06, and serves as an officer in the ASSE Senior Chapter.

There have been some personnel changes in the COE. First, Dr. Carlo Montemango was appointed on July 1, 2006 as the Dean, College of Engineering becoming the 18th Dean of the College. Dean Montemango joins UC from the faculty of UCLA, where he has been serving as the Chair of the Department of Bioengineering. He holds a PhD in Civil Engineering and Geological Sciences from the University of Notre Dame. Second, Dr. Mital has left the OSHE core faculty to focus all of his effort on manufacturing. He has been replaced by Dr. Salem, Associate Professor, Civil and Environmental Engineering who has considerable occupational safety experience. Dr. Genaidy and Dr. Shell have been working with Dr. Salem on an increasing basis for the past three years. These activities include research proposals, publications, student advising and graduate committees largely directed toward safety and health issues in construction management.

Three new courses have been developed and taught during 2005-06: Advanced Occupational Biomechanics (20 INDS 753) taught by Dr. Waters, Adjunct Professor from NIOSH; Safety and Health Engineering-Research to Practice (20 INDS 747) taught by Dr. Genaidy, and Safety by Design (20 INDS 630) taught by Dr. Park. In addition, Dr. Daraiseh is working to develop a course for Behavior Based Safety (20 INDS 632).

We have continued to work with Ken Simonson, Director of UC Emerging Ethnic Engineers to offer the OSHE program with NIOSH Trainee support to minority students. During 2005-06 two minorities, one African-American and one Native-American, were offered admission and both accepted. They will likely complete their MS degree requirements by June 2007.

E. Program Products

A second measure of performance is the number of publications authored by faculty, and by faculty with OSHE students. The journal publications for 2005-06 totaled 21. In addition to the publications listed in Attachment 7b, we were able to complete a Special Issue of "Theoretical Issues in Ergonomics Science", Vol. 7, Number 3, May-June 2006, *Taylor & Francis.* Each article was developed by a small group of OSHE graduate students enrolled in the new course, Safety and Health Engineering-Research to Practice (20 INDS 747) along with faculty monitors. The new course development was funded by the UC ERC NORA grant.

Another major program product is the planning and development for an International Conference on Nanotechnology, Occupational and Environmental Health & Safety: Research to Practice to be held at the Cincinnati (Duke Energy) Convention Center, December 3-8, 2006. The web site for the Conference is: www.uc.edu/nochs/abstractsubmission.

F. Future Plans for 2006-07

- Continue diversity recruitment efforts
- Increase our joint research activities with Ohio University
- Strengthen our research focus on safety and health engineering with the following
  - Service and government
  - Construction
  - Healthcare
- Enter competition for the 2006-07 most outstanding ASSE Student Section Award in the United States
- Facilitate the International Conference on "Nanotechnology, Occupational and Environmental Health & Safety: Research to Practice" to be held at the Cincinnati (Duke Energy) Convention Center, December 3-8, 2006
- Maintain or enhance the following measures of performance:
  - Number of MS and PhD students in the OSHE program
  - Number of publications co-authored by students and faculty, and also by faculty
- Consider the possibility and impact of faculty transfers by Dean Montemagno from MINE to other COE departments.
  - Schedule and meet with the OSHE Advisory Committee
  - Complete a special issue consisting of publications jointly co-authored by OSHE students and faculty to appear in "Human Factors and Ergonomics in Manufacturing"

A. Program Title: **HAZARDOUS SUBSTANCES ACACDEMIC TRAINING**

B. Program Director: **Carol Rice, Ph.D., CIH**

C. Program Description

The educational goal of the program is to provide an exemplary academic program for students that will enable them to become leaders in the field of environmental and occupational hygiene. As part of this program, students specialized hazardous substances classes, complete the 40-hour HAZWOPER program, and engage in ongoing state-of-the-art faculty research and service. The educational program provides a curriculum that enables graduates to achieve the following:

1. Demonstrate a high level of technical and scientific competence in the anticipation, recognition, evaluation and control of occupational and environmental exposures, including the design and development of long-range goals and programs. This may include participation in global professional activities.

2. Solve real-world problems by combining observation, evaluation of the literature, measurement and other data collection and analysis of data.

3. Communicate effectively regarding potential hazards, risk reduction approaches and required actions within the health and safety team, with varying levels of organizational management and other affected stake-holders.

4. Apply the professional code of ethics in all aspects of their practice.

5. Demonstrate an appreciation for the limits of their graduate education and experience by participating in the continuous process of professional development, including continuing education and professional certification.

All trainees participate in the University-mandated training relative to the ethical conduct of their research, if animals or humans are involved. In addition, two courses are required: Academic Conduct, Ethics in Research.

Detailed course Goals and Outcomes formats for the majority of courses allows students to better understand the goals of the course and the specific educational outcomes that are expected. Outcomes are further refined to distinguish between expectations of knowledge or skill gain or development of appropriate professional attitudes. The three full-time faculty funded in this component teach required courses; their efforts are supplemented by one adjunct who teaches the required course in risk assessment. A research thesis relevant to HSAT is required. A complete listing of courses is shown at www.eh.uc.edu/ih.

D. Program Activities and Accomplishments

Progress towards goals and objectives: During 2005-06 the faculty, students, staff, alumni and advisory board members contributed to the preparation of the ABET Self-study. This provided

an opportunity to more fully describe the program elements and to initiate new assessments to better document successes and identify shortcoming.

We have documented success in accomplishing our Measurable Objectives in the areas of Teaching and Professional Development (this includes: high rate of feedback on course evaluations and response by faculty; professional development activities of students measured by attendance at meetings, membership in professional organizations and tracking of CIH exam completion), Research (this includes: faculty publication goals for student research and annual reviews), Service (this includes: CE course participation, outreach, consultations and other service), and Program Development (this includes: graduate activity in the major aspects of practice described in our educational goals, structured recruiting plan, increased alumni communication, response to any program critiques).

Our alumni survey documented that graduates have high levels of activity (greater than 5 on a 7-point scale) and similarly high self-efficacy (confidence to do the activity) for the first four educational goals, shown above. Eighty percent of the respondents documented participation in at least one continuing education activity during the previous year, indicating that most understand the limits of their graduate education (educational goal 5), and the need to continuously acquire new knowledge and skills. Of those seeking CE, more than one-third listed a "global issue" in the topics, consistent with educational goal 1, above. We are tracking CIH exam successes. Seven of the 20 graduates since 2000 are eligible; one successfully completed the exam this year.

The Advisory Board recommended that more effort be made to involve students in local activities. During the year, students participated in Community Emergency Response Training and plans were made for students to be "victims" in a three-state emergency response drill at the Great American Ball Park on September 30, 2006. We believe these activities have enhance the program for students, and are consistent with Advisory Board recommendations.

Trainee honors and awards:

- **James Couch** received the award for the best occupational epidemiology poster from the AIHA Occupational Epidemiology Committee at the 2006 AIHce. Analysis of beryllium exposures at a beryllium manufacturing facility. Coauthors—C Rice, M Schubauer-Berigan, M Peterson, R Hornung.
- **James Couch** was a co-author of a paper receiving the Alice Hamilton Award for best paper in the Human Studies Category at NIOSH. A nested case-control study of leukemia mortality and ionizing radiation at the Portsmouth Naval Shipyard. Authors—T Kubale, R Daniels, J Yiin, J Couch, M Schubauer-Berigan, G Kinnes, S Silver, S Nowlin, P Chen.
- **Jessica Beatty** was accepted as a participant in Disasters: Prevention and Mitigation, a global conference to develop strategies to minimize the human and financial loss of disasters through strategies of coordinated action across national and international entities, government, business and the academy. The meeting was sponsored by the Harvard School of Public Health and the American Academy of Arts and Sciences.

Faculty honors/awards/special appointments: The full-time faculty were recognized for their work throughout the year. Examples for each follow.

- **Dr. Scott Clark** received the 2006 Amicus Poloniae Award from the Republic of Poland at the AIHA Business meeting. Presented to recognize "extraordinary accomplishments in development of Polish-American relations", the award honored Dr. Clark's ten years of support in the development of the profession in Poland.
- **Dr. Carol Rice** served as an ad-hoc member of the NIOSH Safety and Occupational Health study section. She was a co-arranger for Living in a Chemical World III, Bologna Italy and is the Convenor of the annual meeting of Occupational Hygiene Women Faculty.
- **Dr. Glenn Talaska** has been appointed to the International Scientific Advisory Group to plan the International Society for Biological Monitoring 7th Meeting to be held in Peking China, October 2007.

Trainee theses: One M.S. degree was awarded during the year: Estimating historic exposure to arsenic, beryllium, hexavalent chromium, nickel and uranium at a uranium enrichment, gaseous diffusion plant—Kristen Hahn (Dr. Rice, chair)

New faculty positions: None

New courses or content: The content of two courses has been enhanced to include topical areas. Hazardous Materials Management, 26-EIH-834 (Clark) includes coverage of the National Incident Management Plan and requirement that students successfully complete the on-line course, IS-700 in the National Incident Management System. Applied Risk Assessment 26-TOX-878 taught by Dr. Jon Reid included use of the Global Information System software ArcView. Exposure scenarios can be entered and, over time, exposures such as plumes or ground water contamination can be envisioned on a geographic plane, and tracked to various receptors. Additions available for the software allow 2- and 3-dimensional analyses. Combining this with other software, such as CrystalBall allows students to obtain distributions of factors, rather than discrete values, and provides a more powerful tool for human health-based risk assessment.

Trainee recruitment, including diversity: In 2004 the overall Hygiene program implemented a structured recruitment plan after consultation with professional recruiters and a self-study of the market. The plan describes a student-centered approach with annual visits by teams of two current students or recent graduates. Schools in the region include: University of Cincinnati, University of Findlay, Bellarmine University, Western Kentucky University, Eastern Kentucky University, University of Dayton, Central State University and Wittenberg University. We maintain a recruiting effort by "mail" with Clarkson University in Potsdam, NY, due to a history of past applicants and have established a relationship with Xavier University here in Cincinnati. The professional academic recruiters have told us that 6 years of consistent and repetitive implementation is needed to see benefits. At the end of two years of implementation, we can report that of the applications received this year were largely from the targeted schools. Of those accepted for the 2006-07 year, 60 percent are from these schools. One serious inquiry was received from Central State University, a predominantly minority institution, but the application was not completed; this is an improvement from no contacts, however.

E. Program Products

Publications and Presentations: See Appendix C.

Conferences/symposia sponsored: The IH and HSAT programs hosted a joint meeting with the Ohio Valley AIHA section in March 2006, in the Howard Ayer Computer Laboratory and adjoining student room. Students had opportunity to discuss their program with local hygienists and present their research. Students preparing to present posters or platform talks at national meetings used this as an opportunity to get feedback by posting drafts or providing overviews verbally.

Continuing Education courses faculty participated in: Faculty continued to support the dissemination of information, as follows: Dr. Glenn Talaska participated in Industrial Toxicology presented in September by the UC ERC by providing a 1.5 hour lecture on Biological Monitoring.

Successful R2P projects:

- Work by Dr. Scott Clark on the continuing use of lead in paint in Asia has resulted in international interest, including invitation to meet with international officials to devise plans to ban these products.
- A continuing project to train site workers and emergency responders through the NIEHS supported Midwest Consortium for Hazardous Waste Worker Training directed by Dr. Carol Rice documents that 60% of site workers and 80% of emergency responders implement changes in the workplace.

Research projects completed that had significant trainee involvement: Health Effects of Occupational Exposures in PGDP Workers sponsored by NIOSH, a collaboration of Dr. Carol Rice with researchers at the Universities of Kentucky and Louisville, involved Kristen Hahn who derived qualitative historical exposure estimates to a variety of metals used at the facility.

Unique Training courses: Students completed Community Emergency Response Training. HSAT students included Paul Broering and Jessica Beatty.

F. Future Plans

During the coming year, the faculty will develop the detailed Course Goals and Outcomes descriptions developed required IH courses for the HSAT required courses (Applied Risk Assessment, 26-TOX-852, and Human Biological Monitoring and Bio Markers, 26-EIH-843). We will continue the recruiting plan and initiate contact with alumni regarding completion of the CIH exam. Courses will be updated, as new tools important to hazardous materials are developed and acquired. Additional local opportunities for relevant educational and training activities will be sought and documented, as recommended by the Advisory Board.

A. Program Title: CONTINUING EDUCATION

B. Program Director: Judy L. Jarrell, M.A., Ed.D.

C. Program Description

The ERC Continuing Education Program offers courses in all four ERC core areas: occupational medicine, occupational health nursing, environmental/industrial hygiene, and occupational safety. The program is interdisciplinary, utilizing faculty from the College of Medicine, the College of Nursing and Health, the College of Engineering, the College of Arts and Sciences, Department of Mathematics, and the College of Education. Goals of the ERC Continuing Education Program include the development of new short courses based on the needs of the regional occupational medicine, nursing, safety and industrial hygiene professionals it serves, professional accreditation approvals, coordination of interdisciplinary continuing education programming, marketing, administration, and program evaluation. The Cincinnati ERC/CE Office also handles the responsibility of the NIOSH/ERC/CE conference booth, which is displayed at three to four national conferences each year, representing all 16 of the ERC CE programs. The conferences are also very valuable for obtaining needs assessments on a national platform. (Please see attached needs assessments collected from the conferences attended in 2005-2006.)

D. Program Activities and Accomplishments

A great deal of effort has gone into establishing and "growing" a reliable up-to-date email listserv to reach and recruit trainees throughout Region V. The program has also established these listservs to carry "bulletins" to our constituents, which has received positive feedback from them.

E. Program Products

For fiscal year July 1, 2005 – June 30, 2006, 118 on-line and classroom courses/seminars were presented, with 3,233 trainees participating. (Please see tables 12A and 12B for more detail.)

Besides regularly-scheduled course offerings for industrial hygiene, safety, medicine and nursing professionals, the Program collaborated with a number of state-wide and regional organizations to present learning opportunities through conferences and other events: The WOOEMA & SWOOHN Conference in September, 2005; the Building Environment Council of Ohio Fall Conference in October, 2005; the OHNA Conference in March, 2006; and the Allied Construction Industries' Safety Day, February 28, 2006. In addition, the CE Program, working with representatives of the Veteran's Hospital, the U.S. EPA, the Cincinnati Board of Health, and the Southwest Ohio Regional Medical Response System presented a two-day workshop for first responders and two talks by the director of the Office of Public Health Preparedness, U.S. Dept. of Health & Human Services, D. A. Henderson, MD, MPH.

The CE program also assisted in the presentation of the annual Pilot Project Symposium in October, 2005 for the ERC, and the presentation of the Town Hall Meeting in Piqua, Ohio for NIOSH, in March, 2006.

Dr. Judy Jarrell developed three additional training modules for Occupational Medicine for on-line delivery. These training modules are slowly "catching on" and were developed in response to requests by the participants in the in-class 4-week Occupational Medicine Training Program. Three more modules are planned for development and offering on-line in the next fiscal year.

Dr. Jarrell presented a one-day professional development course ("Management Techniques for EHS Professionals") at the annual AIHce in Chicago in May, 2006, and a "Review for Industrial Hygiene Professionals" 5-day course for OSHA personnel in February, 2006.

In addition, Dr. Jarrell has been working with the Occupational Safety Program, and the IH Program in the development, planning, and organization of an international conference on Nanotechnology. NIOSH is co-sponsoring this event as an R2P project. The Conference is scheduled for December 4-7, 2006.

All ERC continuing education courses are developed with the expertise of course directors/principal instructors (please see Table 11 for more detail). A formal ERC/CE Advisory Committee works with Dr. Jarrell in strategic planning for marketing/advertising, course and instructor evaluations, new course development, impact evaluations, and innovative directions for the program. Committee meetings are usually held in the form of conference calls or email interactions.

F. Future Plans

In addition to directing the offering of over 100 short courses, seminars, and conferences, Dr. Jarrell:

- is working with the Allied Constructions Industry Association and the U. C. College of Applied Sciences (Dr. Ben Uwakwah) to institute a "certificate series" on construction safety to be carried by the Department of Construction Sciences within the College.

- is principle PI for a research study on long-term training effectiveness of a one-day course for clinical study nurses (protocol for clinical studies) for which results are expected in Spring, 2007.

- will also assist in another study that has just been funded, "Developing Community Based Models for Education and Utilization of Family Health History Information: A Demonstration Project in Urban Appalachian Communities" (principal investigator: Melanie Myers, Genetic Counseling Graduate Program).

IV. Specific Improvements in Occupational Safety and Health Resulting from ERC Programs

One of the Pilot Research Program projects by a PhD student at Purdue University (Fan Xu,, used a newly-developed wireless video exposure monitoring system (VEM) to investigate the particle exposures of pharmaceutical unit operations for tablet manufacturing in a research and development plant. Video data were combined with the real-time particle measurements to explain the fluctuation of the exposures over the course of the operations. The availability and appropriate use of the engineering controls such as local exhaust ventilation was found to be able to reduce the exposures.

Results of workers compensation loss control research by a recent doctoral graduate from the Environmental and Occupational Hygiene program showed that both "subjective" and "objective" types of benchmarks can be predictive of future losses. This indicated that the regular tracking/ trending of past loss outcomes and the regular subjective auditing of loss prevention and reduction efforts within a company are useful processes. An international workers compensation insurance carrier now uses both subjective and objective types of data to anticipate and reduce losses due to safety and ergonomic exposures.

Hamilton County (OH) has implemented a policy to encourage school districts to retrofit busses to decrease emissions.

Warehouse shipping cartons that were designed by students in the multi-disciplinary Occupational Health Hygiene and Safety Workshop class to reduce stress on the low back, have been adopted by the company nationwide.

Parents of children with respiratory symptoms related to mold and allergens have been shown to follow recommendations for allergen reduction in the home.

One of the Pilot Research Program projects by a PhD student at Purdue University (Fan Xu, used a newly-developed wireless video exposure monitoring system (VEM) to investigate the particle exposures of pharmaceutical unit operations for tablet manufacturing in a research and development plant. Video data were combined with the real-time particle measurements to explain the fluctuation of the exposures over the course of the operations. The availability and appropriate use of the engineering controls such as local exhaust ventilation was found to be able to reduce the exposures.

Several suggestions for workplace design to improve occupational safety and health conditions at Cincinnati area firms that were contained in term projects of students in the Occupational Safety Engineering course were accepted by the firms. These suggestions included: Biomechanical modeling in manual material handling tasks, Compliance of spray paint booth with OSHA regulations, and utilizing health care professionals to help develop a solution for violence at the workplace.

A continuing project to train site workers and emergency responders through the NIEHS supported Midwest Consortium for Hazardous Waste Worker Training, directed by Dr. Carol

Rice, documented that 60% of site workers and 80% of emergency responders implement changes in the workplace.

Midwest residents completing refresher training for hazardous waste site work or emergency response report that during the year they have been able to practice the skills learned in health and safety training (58 and 74%, respectively) and changed behavior to do a task more safely (60 and 81% respectively). These actions are likely to be related to lower exposures and hence an improvement in safety and health.

Safety of first responder and public health personnel has been improved through the Continuing Education Program's presentation of a 1.5-day review activity of an emergency "tabletop" exercise held by the Southwest Ohio Regional Medical Response System in 2005. Lessons learned in this workshop were used to improve the most recent (2006) larger scale exercise.

Safety trainers who attended train-the-trainer courses given by the Continuing Education Program reported long-term effectiveness of the training techniques learned in these courses.

Recently published research that unexpectedly revealed the continuing use of lead in domestic paints currently sold in several Asian countries has resulted in increased national and international awareness of the present and future hazards to children, workers and others from this avoidable public health menace. This awareness has resulted in considerable response, including invitation to meet with international officials to devise plans to ban these products.

APPENDIX A
PROGRAM CURRICULA, COURSE REQUIREMENTS AND SAMPLE CURRICULA BY ACADEMIC PROGRAM

REQUIRED COURSES FOR
COMPREHENSIVE PRACTICE CONCENTRATION, MS

Quarter	Course	Number	Credits
Autumn	Environmental Health Seminar	26-ENV-701	1
Year 1	Principles of Occupational Exposure Assessment	26-EIH-707	3
	Practice in Occupational Exposure Assessment I	26-EIH-741	3
	Programmatic Aspects of Occupational Health & Safety	26-EIH-781	1
	Introduction to Biostatistics	26-BE-787	4
	Identification of Potential Workplace Exposures	26-EIH-904	2
	Occupational Safety Engineering [a]	20-INDS-710	3
	Current Topics in Occupational Hygiene	26-EIH-981	1
			18
Winter	Environmental Health Seminar	26-ENV-702	1
Year 1	Practice in Occupational Exposure Assessment II	26-EIH-742	3
	Introduction to Epidemiology	26-BE-776	3
	Survey of Environmental Toxicology	26-TOX-782	3
	Physical Aspects of the Environment	26-EIH-790	3
	Identification of Potential Workplace Exposures	26-EIH-905	3
	Current Topics in Occupational Hygiene	26-EIH-982	1
			17
Spring	Environmental Health Seminar	26-ENV-703	1
Year 1	Physical & Biological Aspects of Aerosols	26-EIH-743	3
	Evaluation of Workplace Exposures	26-EIH-775	3
	Principles of Ergonomics	26-OSE-792	3
	Current Topics in Occupational Hygiene	26-EIH-983	1
	Electives [b]	----	Var
			15 minimum
Summer [c]			
Autumn	Environmental Health Seminar	26-ENV-701	1
Year 2	Occupational Health, Hygiene and Safety Workshop	26-EIH-819	2
	Teaching Practicum in Environmental Health	26-ENV-725	1 (min)
	Hazardous Materials Management	26-EIH-834	2
	Introduction to Nuclear Engineering and Health Physics	20-NUC-640	3
	Current Topics in Occupational Hygiene	26-EIH-981	1
	Master's Thesis Research [d]	26-ENV-791	Var
	Electives	---	Var
			15 minimum
Winter	Environmental Health Seminar	26-ENV-702	1
	Occupational Health, Hygiene and Safety Workshop	26-EIH-820	2
	Workplace Exposures Measurements - follow-up	26-EIH-971	1
	Ethics in Research	26-GNTD-730	1
	Current Topics in Occupational Hygiene	26-EIH-982	1
	Effective Methods of Worker Health and Safety Training	26-EIH-846	2
	Master's Thesis Research	26-ENV-791	Var
	Electives	---	Var
			15 minimum

Quarter	Course	Number	Credits
Spring	Environmental Health Seminar	26-ENV-703	1
Year 2	Occupational Health, Hygiene and Safety Workshop	26-EIH-821	2
	Current Topics in Occupational Hygiene	26-EIH-983	1
	Master's Thesis Research	26-ENV-791	Var
	Electives	---	Var
			15 minimum

a) Acceptable substitutions for this class are: 20 MINE 779 Safety Engineering and Product Liability (winter quarter) or 20 MINE 621 System Safety 1.

b) Choose a minimum of 9 credits from the following list:

- Stress and Cognition/ 15 PSYCH 824 (3)
- Human Biological Monitoring & Biomarkers/ 26 EIH 843 (3)
- Biomechanical & Physiological Aspects of Muscular Activity/ 26 OSE 744 (3)
- Applied Risk Assessment/ 26 TOX 878 (3)
- Basic Principles of Environmental Law/ 20 CEE 657 (3)
- Management of Professionals/ 20 MINE 640 (3) or Occupational Health Management 26 OCCM 748 (2)
- Methods to Obtain Complete Occupational Histories/ 26 EIH 845 (2)
- Survey of Public Health/ 26 EHS 746 (3) (offered only in academic years beginning with even numbers)
- System Safety I/ 20 MINE 621 (3) (not if taken in place of 20 INDS 771)
- Respirators & Respiratory Protection/ 26 OCCM 854 (2)
- Basics of Occupational Medicine/ 26 OCCM 786 (2) (not offered 2005-06)
- Basics of Environmental Medicine/ 26 OCCM 987 (2) (offered only in academic years beginning with odd number; not offered 2005-06)

c) A summer of internship is recommended for students with no prior EOH work experience. No course credit is given.

d) A form is available in Graduate Studies office must be completed and returned to Graduate Studies.

The student is expected to take all courses listed above. Any required course may be waived with the permission of the instructor and advisor when the student has had the equivalent course content; the graduate studies office has a form to document these approvals. Another course with equivalent credit hours must then be selected. The academic advisor will assist in this process.

REQUIRED COURSES FOR
OCCUPATIONAL SAFETY AND ERGONOMICS - M.S.
(an area of concentration in Industrial Hygiene)

Quarter	Course	Number	Credits
Autumn	Environmental Health Seminar	26-ENV-701	1
Year 1	Practice in Occupational Exposure Assessment I	26-EIH-741	3
	Identification of Potential Workplace Exposures	26-EIH-904	2
	Introduction to Biostatistics	26-BE-787	4
	Principles of Occupational Exposure Assessment	26-EIH-707	3
	Current Topics in Occupational Hygiene	26-EIH-981	1
			16
Winter	Environmental Health Seminar	26-ENV-702	1
	System Safety I	20- MINE-621	3
	Safety Engineering & Product Liability	20- INDS-779	3
	Physical Aspects of Environment	26-EIH-790	3
	Identification of Potential Workplace Exposures	26-EIH-905	3
	Introduction to Epidemiology	26-BE-776	3
	Current Topics in Occupational Hygiene	26-EIH-982	1
			17
Spring	Environmental Health Seminar	26-ENV-703	1
	System Safety II	26-MINE-622	3
	Principles of Ergonomics	26-OSE-792	3
	Introduction to Measurement Techniques in Ergonomics	26- OSE-748	3
	Mgt. of Professionals	20-MINE-640	3
	Current Topics in Occupational Hygiene	26-EIH-983	1
	Electives[a]	-----	Var 15 minimum
Summer	Ergonomic Internship [b]		
	Environmental Health Seminar	26-ENV-701	1
Autumn	Introduction to Nuclear Engineering and Health Physics	20- NUC-640	3
Year 2	Occupational Health Hygiene and Safety Workshop	26-ENV-819	1
	Hazardous Materials Management	26-EIH-834	2
	Biomechanical and Physiological Aspects of Muscular activities	26-OSE-744	3
	Current Topics in Occupational Hygiene	26-EIH-981	1
	Master Thesis Research[c]	26-ENV-791	Var
	Electives	------	Var 15 minimum
Winter	Environmental Health Seminar	26-ENV-702	1
Year 2	Teaching Practicum	26-EIH-725	1-3
	Occupational. Health, Hygiene and Safety Workshop	26-ENV-820	Var
	Ethics in Research	26-GNTD-730	2
	Current Topics in Occupational Hygiene	26-EIH-982	1
	Master Thesis Research	26-ENV-791	1
	Electives	------	Var 15 minimum

Quarter	Course	Number	Credits
Spring	Environmental Health Seminar	26-ENV-703	1
Year 2	Occupational Health, Hygiene and Safety Workshop	26-EIH-821	2
	Current Topics in Industrial Hygiene	26-EIH-983	1
	Master Thesis Research	26-ENV-791	Var
	Electives	---------	Var 15 minimum

a) Student is expected to take all course above and to choose a minimum of 9 credits from the following list:

- Introduction to Biomechanics/ 20-MECH-685 (3)
- Organizational Behavior & Theory / 22-MGMT-711 (4)
- Basics of Occupational Medicine/26-OCCM-786 (2) (offered only in academic years beginning with odd numbers; not offered 2005-06)
- Occupational Safety / 20-INDS-520/710 (3)
- Human Factors Analysis / 20-INDS-624 (3)
- Regression Analysis / 26-BE-788 (3)
- Stress and Cognition / 15-PSYCH-824 (3)
- Basics of Environmental Medicine /26-OCCM-987 (2) (offered only in academic years beginning with odd numbers; not offered 2005-06)
- Nonparametric Statistics / 26-BE-789 (3)
- Human Body Dynamics / 20-MECH-687 (3)
- Human Factors Design / 20-INDS-630 (3)
- Effective Methods of Worker Health and Safety Training/ 26-EIH-846 (2)
- Practice in Occupational Exposure Assessment II/ 26-EIH-742 (3)
- Evaluation of Workplace Exposures/ 26-EIH-775 (3)

b) Students are expected to work as an occupational ergonomic/safety intern or work on his/her thesis during the summer between year 1 and 2. See your advisor for details.

c) A form available in Graduate Studies office must be completed and returned to Graduate Studies.

The student is expected to take all courses listed above. Any required course may be waived with the permission of the instructor and advisor when the student has had the equivalent course content; the graduate studies office has a form to document these approvals. Another course with equivalent credit hours must then be selected. The academic advisor will assist in this process.

MSN in Occupational Health Nursing, Full-Time Program Plan

Autumn	Winter	Spring
Quarter I	*Quarter II*	*Quarter III*
26EIH819* Occupational Health, Hygiene. & Safety Workshop 2 credits 29NURS807 Health Promotion, Risk Reduction 3 credits 29NURS819 Data Base Management Practicum 2 credits = 6 practicum hrs. 29ANCH810 Introduction to Occupational Health Nursing 3 credits 29ANCH851 Epidemiology 3 credits	26EIH820* Occupational Health, Hygiene. & Safety Workshop 2 credits 26TOX782* Survey of Environmental Toxicology 3 credits 29NURS814 Health Planning 3 credits 29ANCH811 Managing Common Occupational & Environmental Diseases and Injuries 3 credits 29NURS804 Statistical Analysis for ANP 3 credits	26EIH821* Occupational Health, Hygiene. & Safety Workshop 2 credits 29NURS805 Research for ANP 3 credits 29NURS816 Human Resources Management 3 credits 29ANCH812 Occupational Health Nursing Practicum 2 credits = 6 practicum hrs. 29ANCH813 Managing Health & Safety Prog in the Wkpl 3 credits
Credits/Quarter: 13 Contact Hours: 17	14 14	13 17
Quarter V	*Quarter VI*	
20INDS710* Occupational Safety 3 credits 26EIH707* Prin of Occupational Exposure Assessment 3 credits 29NURS817 Organization & Management 3 credits 29ANCH814 OHN Practicum 3 credits = 9 practicum hrs. 29NURS808 Health Care Policy & Finance 2 credits	29NURS815 Financial Management 3 credits 29NURS832 Master's Capstone 2 credits 29ANCH815 Occupational Health Nursing Practicum 5 credits = 15 practicum hrs.	
Credits/Quarter: 14 Contact Hours: 20	10 20	

*Interdisciplinary courses

TOTAL CREDIT HOURS REQUIRED = 64

Approved: FacOrg 2/25/97, Grad Council6/10/97, Revised 9/13/00, 6/2/03, 6/04, 7/24/06
T:Program_MSN/ MSN__Schema//Occupational Health Schema

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PhD in Nursing Curriculum Schema

Year 1	Autumn		Winter		Spring		Other
	Pro-seminar I	2 credits	Pro-seminar II	1 credit seminar, 2 credits lab	Pro-seminar III	2 credits seminar, 2 credits lab	* Preliminary Exam --Summer after Year 1
	Nursing Inquiry I	4 credits	Nursing Inquiry II	4 credits	Nursing Inquiry III	5 credits	
	Introduction to Quantitative Methods	3 credits	Introduction to Qualitative Methods	3 credits			
	Statistics	3 credits	Statistics	3 credits	Statistics	3 credits	
Total Credits	**12 credits**		**13 credits**		**12 credits**		
Year 2	Autumn		Winter		Spring		
	Pro-seminar IV	1 credit	Proposal Seminar I	3 credits	Proposal Seminar II	3 credits	** Candidacy Exam: Defense of Proposal -- Summer after Year 2 or Autumn Year 3
	Series of required courses can be taken during any quarter during Year 2 or can be taken prior to Year 1: Advanced Methods—3 credits Advanced Design—3 credits Health Services/Health Policy—3 credits Concentration Courses—21 credits (students will take at least 6 credits in concentration at UC CON)						
Total Credits	**13 credits**		**12 credits**		**12 credits**		
Year 3	Autumn		Winter		Spring		
	Dissertation Seminar	1 credit	Dissertation Seminar	1 credit			
	Dissertation	10 credits	Dissertation	10 credits			
Total Credits	**11 credits**		**11 credits**				

Occupational Health Nursing
Scholarship Roundtables and Visiting Scholars 2006 AY

A. Scholarship Roundtables

October 10, 2005:	Health Resources Services Administration funding opportunities: Get a head start on their new priorities, conceptual framework and performance measurement system; Jan Dyehouse, Nancy Moss
October 24, 2005:	Skin injury and quantifying skin color; Rachel Baker, Lynn Sommers
November 14, 2005:	Improving life in Toxi, Mexico; Faculty from the Universidad Panamerica
November 28, 2005:	Forum on teaching strategies; Kyra Whitmer, Jan Dyehouse
December 5, 2005:	*Capstone Celebration with Master's Students;* Walking for health: measurement and research issues and challenges; Susan Elek, Sue Davis
January 9, 2006:	Graduate fellows program; Kyra Whitmer, Jan Dyehouse, Susan Elek
January 23, 2006:	Increasing your publication success; Elaine Miller
February 13, 2006:	Lessons learned on writing research grants: What happens when the nursing science study section meets?; Lynn Sommers
February 27, 2006:	Doctoral student research practicum; Anita Dempsey
March 13, 2006:	*Capstone Celebration with Master's Students;* Gospel Mission: After hours nurse clinic; Christine Savage, Robin Lee
March 27, 2006:	Functional ability following breast cancer surgery; Beverly Reigle
April 10, 2006:	Journal impact factor: Making your publications count; Doris Haag
April 24, 2006:	Alcohol and heroine use in China: Cultural and political perspective; Christine Savage, Yin Xu
May 8, 2006:	Forging partnerships between research and practice at Cincinnati Children's Hospital; Myra Huth
May 22, 2006:	Concept mapping, competencies, fostering critical thinking skills; Nancy Batchelor , Beverly Reigle, Jeannine Swails, Eileen Werdman
June 5, 2006:	*Capstone Celebration with Master's Students;* Incorporating EBP into the Curriculum; Robin Dennison

B. Visiting Scholars (Institute for Nursing Research)

October 24, 2005, Jamison Fargo, Assistant Professor and Director, Office for Methodological & Data Sciences, Utah State University (with John Schafer): Using epidemiologic methods to calculate odds ratios and relative risks

October 31, 2005, Diane M. Billings, Professor, Indiana University School of Nursing, Associate Dean for Teaching, Learning & Information Resources: Evaluation of on-line courses. Presentation in conjunction with the Nurse Educator Career Mobility Pathway, HRSA

December 8, 2005, Barbara Bowers, Associate Dean for Research and Sponsored Program, University of Wisconsin-Madison: Challenges in long term care and the role of nursing

January 19, 2006, Jamison Fargo, Assistant Professor and Director, Office for Methodological & Data Sciences, Utah State University (with John Schafer): Statistics for evaluating medical tests: Sensitivity and specificity

January 30, 2006, Roger Collins, Professor, College of Education, Criminal Justice, and Human Services, University of Cincinnati: Leveling the playing field: The beginning of a discourse on diversity in our classrooms. Presentation in conjunction with the Nurse Educator Career Mobility Pathway, HRSA

Occupational Medicine
Required Academic Courses (for 2-year Resident)

Courses	Descriptions
Basics of Occupational Medicine (26-OCCM-786)	**Fall quarter, 2 credits. A survey of various occupational medicine topics for physicians, industrial hygienists, nurses, and other health professionals.**
Basics of Environmental Medicine (26-OCCM-987)	**Even-numbered spring quarters, 2 credits. An in-depth survey of pertinent topics, research and case studies in environmental medicine.**
Design and Management of Field Studies (26-BE-975)	**Spring quarter, 4 credits. This course provides an opportunity to acquire the knowledge and skills to formulate a research problem, write a research proposal, and evaluate research. Taken in the first year, it is recommended to have thesis ideas ready prior to taking this class.**
Environmental Health Seminar (26-ENV-701/702/703)	**Fall, winter, and spring quarters, 1 credit for each quarter. This is the departmental grand rounds and the presenter is typically a noted national authority in one of the key areas of environmental health.**
Principles of Occupational Exposure Assessment (26-EIH-707)	**Fall quarter, 3 credits. This course consists of lectures and demonstrations concerning occupational and environmental problems. Industrial hygiene principles and practices area covered.**
Introduction to Biostatistics (26-BE-787)	**Fall quarter, 4 credits. This course covers descriptive statistics, probability distributions, estimation, types of error, significance level, test of hypothesis, sample size, correlation, linear regression, and non-parametric methods.**
Introduction to Epidemiology (26-BE-776)	**Winter or summer quarters, 3 credits. This is an overview of the methodology for study of disease in human populations.**
Occ. Health, Hygiene & Safety Workshop (29-EIH-819, 29-EIH-820, 29-EIH-821)	**Fall, winter, and spring quarters, 1 credit per quarter. This consists of a multidisciplinary workshop with occupational medicine, occupational health nursing, safety engineering and industrial hygiene students working on a team on a group project.**
Principles of Ergonomics (26-EIH-792)	**Spring quarter, 3 credits. This course covers ideas and criteria to achieve optimal mutual fitting of worker capabilities to job requirements.**

Occupational Safety And Health Engineering
CORE AND SUPPORTING FACULTY

The following full-time faculty, partially supported on the training grant, are working to administer and facilitate the occupational safety and health engineering program:

Richard L. Shell, Professor of Industrial Engineering and Professor of Environmental Health (Program Director)

University of Iowa, B.S.M.E. (I.E. Option), 1961
University of Kentucky, M.S.M.E., 1963
University of Illinois, Ph.D., 1970
Occupational safety/management, health and human performance, and manufacturing engineering

Ash M. Genaidy, Associate Professor of Industrial Engineering and Associate Professor of Environmental Health (Deputy Program Director)

Cairo University (Egypt), B.S., 1980
University of Miami, M.S., 1983
University of Miami, Ph.D., 1987
University of Cincinnati, Ph.D., 2004
Epidemiology, safety and health engineering, and biological ergonomics

Sam Salem, Associate Professor of Construction Engineering and Management

Alexandria University (Egypt), B.S., (Civil Engineering)
Clemson University, M.S., 1992
University of Alberta (Canada), Ph.D., 1998
Occupational safety/construction management

Woojin Park, Assistant Professor of Industrial Engineering

Pohang University (South Korea), B.S., 1995
Pohang University (South Korea), M.S., 1997
University of Michigan, Ph.D., 2003
Safety engineering and industrial ergonomics

In addition to the above COE faculty several full-time EH and other COE faculty hold adjunct appointments in Industrial Engineering and lecture in specific classes and serve on graduate committees. These include:

Dorothy F. Byers, Ph.D., Engineering Librarian and Adjunct Professor of Industrial Engineering
Amit Bhattacharya, Ph.D., Adjunct Professor of Industrial Engineering
C. Scott Clark, Ph.D., P.E., CIH, Adjunct Professor of Industrial Engineering
Kermit Davis, Ph.D., Adjunct Assistant Professor of Industrial Engineering

In addition to full-time faculty in the COE and EH, the following off-campus adjuncts have taught courses, served on committees, and/or interfaced with student research in areas relating to the program.

Janet C. Haartz, Adjunct Professor of Industrial Engineering
University of Michigan, B.S. Chem., 1960
University of Cincinnati, M.S. 1964
University of Cincinnati, Ph.D., 1972
Occupational Safety and Health

Thomas R. Huston, Adjunct Associate Professor of Industrial Engineering
University of Cincinnati, Engineering Science, B.S., 1980
University of Cincinnati, M.S.M.E., 1981
University of Cincinnati, Ph.D., 1985
Product liability/safety engineering, statistics, and engineering economy

Steven L. Sauter, Adjunct Professor of Human Factors
University of Wisconsin-Madison, B.A., 1968
University of Wisconsin-Madison, M.A., 1972
University of Wisconsin-Madison, Ph.D., 1975
Occupational stress, safety and health

Rodney J. Simmons, Adjunct Associate Professor of Industrial Engineering
California State University, B.S., 1975
California State University, M.S., 1976
Harvard University, S.M., 1978
Texas A&M University, Ph.D., 1993
System and occupational safety engineering/management

Philip A. Stuebbe, Adjunct Assistant Professor of Industrial Engineering
University of Cincinnati, B.S.C.E., 1982
Xavier University, M.B.A., 1988
University of Cincinnati, M.S.I.E., 1989
University of Cincinnati, Ph.D., 1994
System safety and occupational safety engineering

Naomi G. Swanson, Adjunct Associate Professor of Industrial Engineering
Dakota Wesleyan University, B.A., 1980
University of Wisconsin-Madison, M.A., 1983
University of Wisconsin-Madison, Ph.D., 1989
Ergonomics and psychosocial stressors

Thomas R. Waters, Adjunct Professor of Industrial Engineering
University of South Florida, B.A., 1975
University of Cincinnati, M.S., 1981
University of Cincinnati, Ph.D., 1987
Ergonomics and psychophysiology

REQUIRED MS CORE COURSES AND ASSIGNED FACULTY*

Section 1.01 ***Safety Engineering Courses Faculty***

Occupational Safety Engineering (20-INDS-710)	Shell
System Safety Engineering I (20-MINE-621)	Stuebbe
Safety By Design (20-INDS-630)	Park
Ergonomics Course	
Ergonomics (20-INDS-638) or (26-OSE-792)	Park or Bhattacharya

Section 1.02 ***Interdisciplinary Project Courses***

Occupational Health, Hygiene and Safety Workshop (26-EIH-819, 820, 821)	MINE, OHN & EH faculty

Section 1.03

Section 1.04

Industrial Hygiene Course	
Principles of Occupational Exposure Assessment (26-EIH-707)	Talaska

Section 1.05

Section 1.06

Research Courses	
Experimental Design for Thesis Option (26-BE-789 or 22-QA-720) or	EH or College of Business faculty
Regression Analysis for Non-Thesis Option (26-BE-788 or 22-QA-876)	
Engineering Information Research (20-ENGR-601)	Byers

*27 Credit Hours

COMMONLY SELECTED ELECTIVE COURSES FOR OCCUPATIONAL SAFETY AND HEALTH ENGINEERING

Course Title and Number

AUTUMN QUARTER

- Basis of Occupational Medicine (26-OCCM-786)
- Introduction to SAS Programming (26-BE-778)
- Emerging Health Issues (29-ANCH-856)
- Biomechanics (20-INDS-752 or 26-OSE-744)

WINTER QUARTER

- General Occupational Medicine Clinic (26-OCCM-899)
- Safety Engineering and Product Liability (20-MINE-779)
- Tissue Biomechanics (20-MECH-686)
- Introduction into Epidemiology (26-BE-776)
- Survey of Environmental Toxicology (26-TOX-782)

SPRING QUARTER

- System Safety Engineering II (20-MINE-622)
- Management of Professionals (20-MINE-640)
- Human Body Dynamics (20-MINE-687)
- Probability Risk Assessment (20-NUC-680)

SUMMER QUARTER

- Safety Engineering Design and Management (20-MINE-780)

OCCUPATIONAL SAFETY AND HEALTH ENGINEERING MATHEMATICS/RESEARCH ELECTIVES

Course Title	Course Number	Credit Hours
AUTUMN QUARTER		
Applied Statistical Inference	15-MATH-531	3
Linear Models and Multivariate Analysis	15-MATH-613	4
Intermediate Analysis of Variance ♦	26-BE-777	3
Introduction to Biostatistics	26-BE-787	4
Rates and Proportions ♦	26-BE-797	3
Fourier Transform Techniques	20-MECH-660	3
WINTER QUARTER		
Applied Regression Analysis *	15-MATH-532	3
SAS Programming	15-MATH-534	3
Linear Programming	15-MATH-524	3
Linear Models and Multivariate Analysis	15-MATH-614	4
Regression Analysis*	26-BE-788	4
Intro to SAS Programming	26-BE-778	2
SPRING QUARTER		
Analysis of Variance	15-MATH-533	3
Linear Programming	15-MATH-525	3
Linear Models and Multivariate Analysis	15-MATH-615	4
Experimental Design ♦	26-BE-789	4
Survey Sampling ♦	26-BE-794	3
Nonparametric Statistics ♦	26-BE-795	3
Logistic Regression	26-BE-871	3

♦Course offered alternate years
* May have been taken in the OSHE core course requirement

PROGRAM OF STUDY, MASTER OF SCIENCE – THESIS OPTION
(Occupational Safety and Health Engineering)

Course Title and Number		Credit Hours
AUTUMN QUARTER		
*Occupational Safety Engineering (20-INDS-710)		3
*Occupational Health, Hygiene and Safety Workshop (26-EIH-819)		2
*Principles of Occupational Exposure Assessment (26-EIH-707)		3
Mathematics or Technical Elective		6
	ST	14
WINTER QUARTER		
*System Safety Engineering I (20-MINE-621)		3
*Engineering Information Research (20-ENGR-601)		2
*Occupational Health, Hygiene and Safety Workshop (26-EIH-820)		2
Mathematics or Technical Elective		3
MS Research (20-MINE-871)		3
	ST	13
SPRING QUARTER		
*Safety By Design (20-INDS-630)		3
*Ergonomics (20-INDS-630) or (26-OSE-792		3
*Occupational Health, Hygiene and Safety Workshop (26-EIH-821)		2
*Experimental Design (26-BE-789) or (22-QA-720)		4
MS Research (20-MINE-871)		3
	ST	15
SUMMER QUARTER		
Thesis (20-MINE-800)		9
	ST	9
TOTAL MINIMUM CREDITS		51

* Indicate MS core courses, 27 credit hours

PROGRAM OF STUDY, MASTER OF SCIENCE –NON-THESIS OPTION
(Occupational Safety and Health Engineering)

Course Title and Number		Credit Hours
AUTUMN QUARTER		
*Occupational Safety Engineering (20-INDS-710)		3
*Occupational Health, Hygiene and Safety Workshop (26-EIH-819)		2
*Principles of Occupational Exposure Assessment (26-EIH-707)		3
Mathematics or Technical Elective		6
	ST	14
WINTER QUARTER		
*System Safety Engineering I (20-MINE-621)		3
*Engineering Information Research (20-ENGR-601)		2
*Occupational Health, Hygiene and Safety Workshop (26-EIH-820)		2
Regression Analysis (26-BE-788) or (22-QA-722)		4
Math or Technical Elective		3
	ST	14
SPRING QUARTER		
*Safety By Design (20-INDS-630)		3
*Ergonomics (20-INDS-630) or (26-OSE-792)		3
*Occupational Health, Hygiene and Safety Workshop (26-EIH-821)		2
Mathematics or Technical Electives		6
	ST	14
SUMMER QUARTER		
MS Research-Project (20-MINE-871)		9
	ST	9
TOTAL MINIMUM CREDITS		51

* Indicate MS core courses, 27 credit hours

REQUIREMENTS FOR ADMISSION INTO THE MASTER OF SCIENCE PROGRAM FOR THOSE STUDENTS WITHOUT A BS DEGREE IN ENGINEERING

All applicants must fulfill general University and Departmental admission requirements as specified in "A Manual for the Guidance of Graduate Students." Applicants possessing non-engineering baccalaureate degrees are evaluated on their individual merits. For engineering admission, the non-engineering baccalaureate degree holder will have completed or will complete as make-up requirements the following minimum number of courses or their equivalent:

Course*	Number	Credit Hrs
Differential Equations (plus pre-reqs.)	20-MATH-273	5
General Physics I, II, III	15-PHYS-201, 202, 203	12
General Physics Lab I, II, III	15-PHYS-211, 212, 213	3
First Year Chemistry	15-CHEM-101, 102	8
Mechanics I, II	20-ENFD-101, 102	6
Computer Language	20-ENFD-111	3
Graphics Fundamentals	20-ENFD-250	3
Basic Electric Circuit Analysis	20-ENFD-371	3
Nature and Properties of Materials	20-ENFD-376	3
Basic Strength of Materials	20-ENFD-375	3
Basic Thermodynamics	20-ENFD-382	3
Basic Fluid Mechanics	20-ENFD-383	3
Basic Heat Transfer	20-ENFD-385	3
Four upper level undergraduate courses	TBD	12

*Equivalent courses are also available in the UC College of Applied Science and/or the McMicken College of Arts and Sciences.

EXAMPLE PROGRAM OF STUDY FOR DOCTOR OF PHILOSOPHY ASSUMING COMPLETION OF MASTER OF SCIENCE

NOTE: The minimum second year coursework requirements are 45 hours, of which at least 18 hrs are MINE Department courses. Based upon the student's background and goals, as well as course availability, the student and advisor will develop a program of study. Shown below is just one example of a second year program of study for a student who wishes to have a mix of safety and health engineering, industrial hygiene, and environmental courses.

Course Title and Number AUTUMN QUARTER		Credit Hours
**Categorical Data Analysis (26-BE-797)		3
or Logistic Regression and Log Linear Models (26-BE-871)		
Introduction into SAS Programming (26-BE-778)		2
Emerging Health Issues (29-ANCH-856)	3	
* Biomechanics (20-INDS-752)		3
* Environmental Health Seminar (26-ENV-701)		1
Special Topics (20-MINE-870)		1
	ST	13
WINTER QUARTER		
**Introduction into Epidemiology (26-BE-776)		3
* Safety Engineering and Product Liability (20-MINE-779)		3
**Survey of Environmental Toxicology (20-TOX-782)		3
Tissue Biomechanics (20-MINE-686)		3
* Environmental Health Seminar (26-ENV-702)		1
	ST	13
SPRING QUARTER		
**Design and Management of Field Studies (26-BE-975)		3
System Safety Engineering II (20-MINE-622)		3
Management of Professionals (20-MINE-640)		3
*Probability Risk Assessment (20-NUC-680)		3
*Environmental Health Seminar (26-ENV-703)		1
	ST	13
SUMMER QUARTER		
**Critical Appraisal of Epidemiological Studies (26-BE-968)		3
*Safety Engineering Design and Management (20-MINE-778)		3
	ST	6
Total Credit Hours		45

** Indicates additional 15 credit hours of research and * indicates 15 hours of safety and health engineering core courses for the PhD. The third/fourth year of the doctoral program requires completion of the dissertation, and 12 credit hours of communication courses.

Special Topics-Toxicology (26-OCCM-791)	**Taught by Dr. Donovan and intended for occupational medicine residents, this course emphasizes the toxicology of clinical occupational and environmental medicine. Special topics in toxicology may be taken as independent study or with other occupational medicine residents, and is scheduled by mutual arrangement with Dr. Donovan.**
Survey of Public Health (26-OCCM-746)	**Spring quarter in odd-numbered years, 3 credits. This is an overview of various topics in public health, and issues of current public health concern suitable for graduate students with a wide variety of health care career interests.**

3 credit hours are required by the Occ Med Boards in Healthcare Management. These courses have been used in the past to fulfill this requirement.

Occupational Health Management (26-OCCM-748)	**Spring quarter in even-numbered years, 3 credits. This course is a study of the application of standard business practices and principles in occupational health.**
Management of Professionals [taught at the College of Engineering] (20-MINE-640)	**Spring quarter, 4 credits, this course is an introduction to the principles and procedures of management for professionals and the role of administration in engineering, health care and other professional areas.**

Lung and the Environment (26-OCCM-849) and (26-OCCM-850)	**Winter quarter in even-numbered years, 4 credits. This course consists of lectures and discussions presented on etiology, pathogenesis, evaluation and treatment of lung diseases of occupational and environmental origin.**

Medicolegal Skills (Ross) (26-OCCM-to be assigned)	**Winter quarter, 2 credits. This course consists of introduction to the legal system and how scientists and clinicians interact with the system. Topics include expert witness issues, legislative process, case law development, standard development and policy development.**

REQUIRED COURSES FOR
HAZARDOUS SUBSTANCES CONCENTRATION, MS

Quarter	Course	Number	Credits
Autumn	Environmental Health Seminar	26-ENV-701	1
Year 1	Principles of Occupational Exposure Assessment	26-EIH-707	3
	Practice in Occupational Exposure Assessment I	26-EIH-741	3
	Programmatic Aspects of Occupational Health & Safety	26-EIH-781	1
	Introduction to Biostatistics	26-BE-787	4
	Identification of Potential Workplace Exposures	26-EIH-904	2
	Occupational Safety Engineering[a]	20-INDS-710	3
	Current Topics in Occupational Hygiene	26-EIH-981	1
			18
Winter	Environmental Health Seminar	26-ENV-702	1
Year 1	Practice in Occupational Exposure Assessment II	26-EIH-742	3
	Introduction to Epidemiology	26-BE-776	3
	Survey of Environmental Toxicology	26-TOX-782	3
	Physical Aspects of the Environment	26-EIH-790	3
	Identification of Potential Workplace Exposures	26-EIH-905	3
	Current Topics in Occupational Hygiene	26-EIH-982	1
			17
Spring	Environmental Health Seminar	26-ENV-703	1
Year 1	Physical & Biological Aspects of Aerosols	26-EIH-743	3
	Human Biological Monitoring & Biological Markers	26-EIH-843	3
	Evaluation of Workplace Exposures	26-EIH-775	3
	Principles of Ergonomics	26-OSE-792	3
	Current Topics in Occupational Hygiene	26-EIH-983	1
	Electives[b]	---	Var
			15 minimum
Summer[c]			
Autumn	Environmental Health Seminar	26-ENV-701	1
Year 2	Teaching Practicum in Environmental Health	26-ENV-725	1 (min)
	Occupational Health, Hygiene and Safety Workshop	26-EIH-819	2
	Hazardous Materials Management	26-EIH-834	2
	Introduction to Nuclear Engineering and Health Physics	20-NUC-640	3
	Current Topics in Occupational Hygiene	26-EIH-981	1
	Master's Thesis Research[d]	26-ENV-791	Var
	Electives	---	Var
			15 minimum
Winter	Environmental Health Seminar	26-ENV-702	1
Year 2	Workplace Exposure Measurements – follow-up	26-EIH-971	1
	Occupational Health, Hygiene and Safety Workshop	26-EIH-820	2
	Ethics in Research	26-GNTD -730	1
	Current Topics in Occupational Hygiene	26-EIH-982	1
	Effective Methods of Worker Health and Safety Training	26-EIH-846	2
	Master's Thesis Research	26-ENV-791	Var
	Electives	---	Var
			15 minimum

Quarter	Course	Number	Credits
Spring	Environmental Health Seminar	26-ENV-703	1
Year 2	Occupational Health, Hygiene and Safety Workshop	26-EIH-821	2
	Applied Risk Assessment	26-TOX-878	2
	Current Topics in Occupational Hygiene	26-EIH-983	1
	Master's Thesis Research	26-ENV-791	Var
	Electives	---	Var
			15 minimum

a) Acceptable substitutions for this class are: 20 MINE 779 Safety Engineering and Product Liability (winter quarter) or 20 MINE 621 System Safety 1.

b) Choose a minimum of 9 credits from the following list:

- Basics of Environmental Medicine/ 26 OCCM 987 (2) (offered only in academic years beginning with odd number; not offered 2005-06)
- Biomechanical & Physiological Aspects of Muscular Activity/ 26 OSE 744 (3)
- Basics of Occupational Medicine/ 26 OCCM 786 (2) (not offered 2005-06)
- Basic Principles of Environmental Law/ 26 CEE 657 (3)
- Management of Professionals/ 20 MINE 640 (3) or Occupational Health Management (2) 26 OCCM 748
- Stress and Cognition/ 15 PSYCH 824 (3)
- Methods to Obtain Complete Occupational Histories/ 26 EIH 845 (2)
- Survey of Public Health/ 26 EHS 746 (3) (offered only in academic years beginning with even number)
- System Safety I / 20 MINE 621 (3)
- Respirators & Respiratory Protection/ 26 OCCM 854 (2)
- GIS Planning Applications/ 23 PLAN 681 (4)
- Introduction to GIS Systems for Planners/ 23 PLAN 780 (4)

c) A summer internship is recommended for students with no prior EOH work experience. No course credit is given.

d) A form available in Graduate Studies office must be completed and returned to Graduate Studies.

The student is expected to take all courses listed above. Any required course may be waived with the permission of the instructor and advisor when the student has already had the equivalent course content; the graduate studies office has a form to document these approvals. Another course with equivalent credit hours must then be selected. The academic advisor will assist in this process.

APPENDIX B
UPDATED DATA TABLES 4a, 11, 12a, 12b AND 13
ORGANIZED BY PROGRAM AREA
(7/1/2005-6/30/2006)

ERC Applicant Institution: University of Cincinnati
Program Director: Carol Rice, PhD
Discipline: Environmental and Occupational Hygiene

Table 4a
Academic Training Report
Previous Budget Period: July 1, 2005 to June 30, 2006

Degree Awarded	How Does Degree Read?	# Full-Time Trainees Enrolled[1]	# Full-Time NIOSH-Supported Trainees	# Part-Time Trainees Enrolled	# Part-Time NIOSH-Supported Trainees	# Other Trainees Taking OS&H Courses[2]	# Trainees Graduated
Baccalaureate/associate degree							
Master's degree							
MS	MS	4	3	3	0	17	2
Doctorate degree							
PhD	PhD	12	0	4	0	0	3
Post-doctoral (Include formally registered Occupational Medicine residents in all years of the residency.)[3]							
Other (specify, e.g., undergraduate Certificate program trainees)							

Refer to: Supplemental Instructions, page 10.
[1] Trainee counts include all students in the approved programs.
[2] Does not include trainees counted in any of the full-time or part-time categories
[3] In this case, there may be double counting between Doctorate degree and Post-doctoral categories.

ERC Applicant Institution: University of Cincinnati
Program Director: Carol Rice, Ph.D., CIH
Discipline: Environmental and Occupational Hygiene

Table 13
Minority Recruitment Data[1]
Previous Budget Period: July 1, 2005 to June 30, 2006

GROUP DATA			INDIVIDUAL DATA			
# of Minorities Applied	**# of Minorities Offered Admission**	**# of Minorities Entered Program**	**For those who entered program: Identify by sequential #**	**Current Status (in training, graduated, left the program, etc.)**	**Sources of Support**	**Subsequent Career Development/ Employment**
4	3	2	Student 1	In Training	ERC	N/A
			Student 2	In Training	University Funds	N/A

Refer to: Supplemental Instructions, page 13.
[1] First three columns are a group total; last four columns refer to individual trainees.

ERC Applicant Institution: University of Cincinnati
Program Director: L. Sue Davis, Ph.D.
Discipline: Occupational Health Nursing

Table 4a
Academic Training Report
Most Recent Year Only

Degree Awarded	How Does Degree Read?	# Full-Time Students Enrolled	# Full-Time NIOSH-Supported Students	# Part-Time Students Enrolled	# Part-Time NIOSH-Supported Students
MSN	Master of Science in Nursing	4	4	2	0
PhD	Doctor of Philosophy	3	3	0	0

ERC Applicant Institution: University of Cincinnati

Program Director: Clara Sue Ross, MD, JD

Discipline: Occupational Medicine

Table 4a

Academic Training Report

Previous Budget Period: July 1, 2005 to June 30, 2006

Degree Awarded	How Does Degree Read?	# Full-Time Trainees Enrolled[1]	# Full-Time NIOSH-Supported Trainees	# Part-Time Trainees Enrolled	# Part-Time NIOSH-Supported Trainees	# Other Trainees Taking OS&H Courses[2]	# Trainees Graduated
Baccalaureate/associate degree							
Master's degree							
Doctorate degree							
Post-doctoral (Include formally registered Occupational Medicine residents in all years of the residency.)[3]							
MS	Occupational Medicine	6	4	0	0	25	2
Other (specify, e.g., undergraduate Certificate program trainees)							

Refer to: Supplemental Instructions, page 10.

[1] Trainee counts include all students in the approved programs.

[2] Does not include trainees counted in any of the full-time or part-time categories

[3] In this case, there may be double counting between Doctorate degree and Post-doctoral categories.

ERC Applicant Institution: University of Cincinnati

Program Director: Clara Sue Ross, MD, JD

Discipline: Occupational Medicine

Table 13

Minority Recruitment Data[1]

Previous Budget Period: July 1, 2005 to June 30, 2006

GROUP DATA			INDIVIDUAL DATA			
# of Minorities Applied	**# of Minorities Offered Admission**	**# of Minorities Entered Program**	**For those who entered program: Identify by sequential #**	**Current Status (in training, graduated, left the program, etc.)**	**Sources of Support**	**Subsequent Career Development/ Employment**
0	0	0				

Refer to: Supplemental Instructions, page 13.

[1] First three columns are a group total; last four columns refer to individual trainees.

ERC Applicant Institution: University of Cincinnati
Program Director: Scott Clark, PhD, CIH ; Richard L. Shell, PhD, PE
Discipline:Occupational Safety and Health Engineering

Table 4a
Academic Training Report
Previous Budget Period: July 1, 2005 to June 30, 2006

Degree Awarded	How Does Degree Read?	# Full-Time Trainees Enrolled[1]	# Full-Time NIOSH-Supported Trainees	# Part-Time Trainees Enrolled	# Part-Time NIOSH-Supported Trainees	# Other Trainees Taking OS&H Courses[2]	# Trainees Graduated
Baccalaureate/associate degree							
BS	ME, IE, CE					55	55
Master's degree							
MS	Industrial Engineering (Occup.	13	9	3	0	10	3
	Safety & Health Engineering)						
	Specialization						
Doctorate degree							
PhD	(same as above)	8	2	0	0	6	2
Post-doctoral (Include formally registered Occupational Medicine residents in all years of the residency.)[3]							
Other (specify, e.g., undergraduate Certificate program trainees)							

Refer to: Supplemental Instructions, page 10.

[1] Trainee counts include all students in the approved programs.

[2] Does not include trainees counted in any of the full-time or part-time categories

[3] In this case, there may be double counting between Doctorate degree and Post-doctoral categories.

ERC Applicant Institution: University of Cincinnati
Program Director: Scott Clark, PhD, CIH; Richard L. Shell, PhD, PE
Discipline: Occupational Safety and Health Engineering

Table 13
Minority Recruitment Data[1]
Previous Budget Period: July 1, 2005 to June 30, 2006

GROUP DATA			INDIVIDUAL DATA			
# of Minorities Applied	**# of Minorities Offered Admission**	**# of Minorities Entered Program**	**For those who entered program: Identify by sequential #**	**Current Status (in training, graduated, left the program, etc.)**	**Sources of Support**	**Subsequent Career Development/ Employment**
2	2	2	0	Both in MS	NIOSH Trainees	
				Program OS&HE		

Refer to: Supplemental Instructions, page 13.
[1] First three columns are a group total; last four columns refer to individual trainees.

ERC Applicant Institution:University of Cincinnati
Program Director: Carol Rice, Ph.D., CIH
Discipline: HSAT

Table 4a
Academic Training Report
Previous Budget Period: July 1, 2005 to June 30, 2006

Degree Awarded	How Does the Degree Read?	# Full-Time Trainees Enrolled[1]	# Full-Time NIOSH-Supported Trainees	# Part-Time Trainees Enrolled	# Part-Time NIOSH-Supported Trainees	# Other Trainees Taking OS&H Courses[2]	# Trainees Graduated
Baccalaureate/associate degree							
Master's degree							
MS	MS	3	3	0	0	20	1
Doctorate degree							
Post-doctoral (Include formally registered Occupational Medicine residents in all years of the residency.)[3]							
Other (specify, e.g., undergraduate Certificate program trainees)							

Refer to: Supplemental Instructions, page 10.

[1] Trainee counts include all students in the approved programs.

[2] Does not include trainees counted in any of the full-time or part-time categories

[3] In this case, there may be double counting between Doctorate degree and Post-doctoral categories.

ERC Applicant Institution: University of Cincinnati
Program Director: Carol Rice, PhD
Discipline: HSAT

Table 13
Minority Recruitment Data[1]
Previous Budget Period: July 1, 2005 to June 30, 2006

GROUP DATA			INDIVIDUAL DATA			
# of Minorities Applied	# of Minorities Offered Admission	# of Minorities Entered Program	For those who entered program: Identify by sequential #	Current Status (in training, graduated, left the program, etc.)	Sources of Support	Subsequent Career Development/ Employment
		NONE				

Refer to: Supplemental Instructions, page 13.
[1] First three columns are a group total; last four columns refer to individual trainees.

ERC Applicant Institution: University of Cincinnati

Program Director: Judy Jarrell, Ph.D.

Table 11

Continuing Education Faculty

Faculty Name	Primary Affiliation[1] [If Academic, include Department]		Role in Proposed CE Program[2]
	Discipline	Institution/Employer	
Jonathan Bernstein	Immunology	University of Cincinnati	Instructor
Amit Bhattacharya	Ergonomics	University of Cincinnati	Course Director/Inst.
Kermit Davis	Ergonomics/IH	University of Cincinnati	Instructor
Linda Sue Davis	Occupational Nursing	University of Cincinnati	Course Director/Inst.
Sergey Grinshpun	IH & BioDefense	University of Cincinnati	Instructor
Ashraf Genaidy	Ergonomics/Engineering	University of Cincinnati	Course Director/Inst.
Judy Jarrell	Training	University of Cincinnati	Course Director/Inst.
Roy McKay	Pulmonary Toxicology/Occup. Med.	University of Cincinnati	Course Director/Inst.
Richard Shell	Occupational Safety	University of Cincinnati	Course Director/Inst.
Mingming Lu	Engineering - Air Pollution	University of Cincinnati	Instructor
William Menrath	IH & Safety	University of Cincinnati	Course Director/Inst.
Stuart Baxter	Toxicology	University of Cincinnati	Course Director/Inst.
Ralph Buncher	Epidemiology/Biostatistics	University of Cincinnati	Instructor
D. A. Henderson	Public Health/BioDefense	U.S. Dept of Health & Human Services	Instructor
Kim Burke	Environmental Law	Taft, Stettinius & Holister	Instructor
Lonnie Jones	Hazardous Materials	Grtr Cinti Occupational Health Center	Instructor
Douglas McInvain	Risk Assessment	Tetra Tech Inc	Instructor
Barbara Boylan	Lead Abatement	Self-employed	Course Director/Inst.
Eric Stephan	Construction Safety	Solutions to Safety Problems	Course Director/Inst.
John Dimos	Industrial Hygiene & Safety	Self-employed	Course Director/Inst.
Kurt Varga	Construction Safety	In-service Training, Inc.	Course Director/Inst.
Larry Wilson	Construction Safety	Varga-Wilson, Inc.	Course Director/Inst.
Mary Malotke	IH & Engineering	Techni-Train, Inc./Tencon, Inc.	Course Director/Inst.
Charles Nenadic	IH, Engineering & Law	Self-employed	Course Director/Inst.
James McGlothlin	IH, Ergonomics, Safety	Purdue University	Course Director/Inst.
James Romine	IH & Safety	Self-employed	Course Director/Inst.

Refer to: Supplemental Instructions, page 10.

[1] Industrial Hygiene, Occupational Health Nursing, Agricultural Safety and Health, etc.

[2] Instructor, speaker, course director, etc.

ERC Applicant Institution: University of Cincinnati

Program Director: Judy L. Jarrell, Ed.D.

Table 12a

CE Course Offerings by Program Area

Current Budget Period: July 1, 2005 to June 30, 2006

Program Area: Occupational Medicine

					# Trainees by Profession					# Trainees by Employer						
Course/Seminar Title[1]	Program Area	Total Trainees	Length of Course	Total Pers Days	MD	NURS	HYG	SAFETY	OTHER	Private Industry	Fed Gov	State Gov	Local Gov	Foreign Country	Academic	Other
Barriers to Employability (On line)	OM	1	0.125	0.125		1				1						
Cost of Disability (On-Line)	OM	2	0.125	0.25					2	2						
Ethics In Occupational Medicine (On-line)	OM	2	0.125	0.25					2	2						
Periodic Medical Evalualtions (On-line)	OM	3	0.125	0.375	2	1				3						
Respiratory Medical Clearance (On-line)	OM	4	0.125	0.5		1			3	4						
Malcolm Adcock Memorial Lecture Series: "New Infectious Diseases Challenges for the 21st Century 3/23/06	OM	136	0.125	17	21	6			109	4	1	10	1		1	119
Public Health Grand Round: The Death and Resurection of a Virus	OM	77	0.125	9.625	12				65	4	1	15	3			54
Spirometry for Physicians 10/5/05	OM	13	1	13	9	2			2	6	2		1			4
Workplace Health, Wellness, and Safety: Evolving Issues 9/23-24/2005	OM	56	2	112	45	7			4	49	2	3.00			2.00	
Subtotal [Program]	OM	294	4	153	89	18	0	0	187	75	6	28	5	0	3	177

Program Area: Occupational Nursing

					# Trainees by Profession					# Trainees by Employer						
Course/Seminar Title[1]	Program Area	Total Trainees	Length of Course	Total Pers Days	MD	NURS	HYG	SAFETY	OTHER	Private Industry	Fed Gov	State Gov	Local Gov	Foreign Country	Academic	Other
Development of Chemical Cartridge Change Out Schedules 7/29/2005	ON	7	0.5	3.5				7				7				
Respirator Selection and Change Out Schedules 8/17-18/2005	ON	29	2	58				29		1	28					
Overview of Respiratory Protection 9/13/2005	ON	10	1	10		1	1	7	1	1	1					8
Respiratory Fit Testing Workshop 9/14-15/2005	ON	10	2	20		1	1	7	1	1	1					8
Spirometry Refresher Update 9/29/2005	ON	7	1	7		7					7					
NIOSH-Approved Spirometry 10/17-19/2005	ON	29	3	87		12		2	15	11	10		1			7
Overview of Respiratory Protection 11/15/2005	ON	11	1	11				11		10	1					
The FISH Philosphy! 11/16/2005	ON	8	1	8		8				8						
Respiratory Fit Testing Workshop 11/16-17/2005	ON	10	2	20				10			10					
Respirator Fit Testing Workshop 1/24/2006	ON	16	1	16	1	2	2	1	10	13	3					
Fit Test Workshop 2/21-22/06	ON	24	2	48				24			24					
Respirator Selection and Cartridge Change Out Schedule Workshop 3/9-10/06	ON	16	2	32			8	7	1	3	13					
"Presenteeism": The Newest Variable in the Productivity Equation 3/17-18/06	ON	103	0.6	61.8		72			31	96		5	1		1	
Spirometry Update-Refresher 3/28/06	ON	12	1	12	2	8		2		12						
Spirometry Refresher Update 3/29/06	ON	12	1	12	2	10				12						
NIOSH-Approved Spirometry 4/3-5/06	ON	19	3	57		12			7	8	2					9
Fit Test Workshop 4/19-20/06	ON	13	2	26		13					13					

Overview of Respiratory Protection 4/24/06	ON	22	1	22	3	8	1	5	5	9	5	1	2			5
Fit Test Workshop 4/25-26/06	ON	19	2	38	2	8	1	4	4	7	5	1	2			4
Spirometry Update Refresher 5/7/06	ON	5	1	5		5				5						
OSHA Update Implications for Occupational Health & Safety Professionals 5/23/06	ON	25	1	25		25										25
Subtotal [Program]	ON	407	31	579	10	192	14	116	75	197	123	14	6	0	1	66
Program Area: Industrial Hygiene																
					# Trainees by Profession					**# Trainees by Employer**						
Course/Seminar Title[1]	**Program Area**	**Total Trainees**	**Length of Course**	**Total Pers Days**	**MD**	**NURS**	**HYG**	**SAFETY**	**OTHER**	**Private Industry**	**Fed Gov**	**State Gov**	**Local Gov**	**Foreign Country**	**Acad emic**	**Other**
Building Inspection/Management Planner Refresher 7/7/05	IH	9	1	9			3	2	4	6			2		1	
OSHA Guilde to Industrial Hygiene, OSHA 521 7/26-29/05	IH	1	3.5	3.5			1			1						
Comprehensive Review for IH Professional 8/22-26/05	IH	7	4.5	31.5			1	1	5	2						5
Lead Risk Assesor Refresher 9/14/05	IH	6	1	6			2		4	4					2	
Asbestos Abatement Project Designer Refresher 9/20/05	IH	6	1	6			3		3	5	1					
Building Inspection/Management Planner Refresher 9/21/05	IH	21	1	21			4	1	16	14		1	4		2	
Sixth Annual Pilot Research Symposium 2 days 10/20-21/05	IH	23	1	23			13		10	16	1	1			5	
Sixth Annual Pilot Research Symposium Day 1 10/20-21/05	IH	76	0.5	38	1		20		55	60	1	1			14	
Sixth Annual Pilot Research Symposium Day 2 10/20-21/05	IH	16	0.5	8			1		15			1			15	

Asbestos Abatement Project Designer Refresher 11/30/05	IH	2	0.5	1			2			2						
Lead Risk Assessor Refresher 12/1/05	IH	2	0.5	1					2	2						
Building Inspection Procedures Refresher-12/1/05	IH	14	0.5	7			4		10	12			2			
Asbestos Abatement Project Designer Refresher 1/25/06	IH	4	0.5	2					4	1					3	
Building Inspection Procedures Refresher-1/26/06	IH	11	0.5	5.5				2	9	3		2			6	
Lead Risk Assessor Refresher 2/9/06	IH	2	1	2			1		1	1			1			
Preparatory Course for IH Professionals 2/13-17/06	IH	11	4.5	49.5				11			7	4				
Building Inspection/Management Planner Refresher 2/16/06	IH	13	1	13			3	3	7	6	2				4	1
Comprehensive Review for IH Professional 3/20-24/06	IH	8	4.5	36			8			8						
Hazardous Materials, OSHA 2015 (on-line)	IH	1	3.5	3.5			1				1					
Asbestos Abatement Project Designer Refresher 5/17/06	IH	2	1	2			1		1	2						
Building Inspection/Management Planner Refresher 5/18/06	IH	15	1	15				6	9	11			3		1	
Management Techniques for the EHS Professionals - May 13, 2006 (AIHA)	IH	28	1	28			28			24				3	1	
Hazardous Materials Management Certification Review 6/20-22/06	IH	4	3	12				1	3	3			1			
Subtotal [Program]	IH	282	37	324	1	0	96	27	158	183	13	10	13	3	54	6

Program Area: Occupational Safety

					# Trainees by Profession					# Trainees by Employer						
Course/Seminar Title[1]	Program Area	Total Trainees	Length of Course	Total Pers Days	MD	NURS	HYG	SAFETY	OTHER	Private Industry	Fed Gov	State Gov	Local Gov	Foreign Country	Academic	Other
Trainer Course for Construction Industry, OSHA 500 6/28-7/1/05	OS	11	3.5	38.5				11		10						1
Contractor/Supervisor Asbestos Abatement Refresher 7/8/05	OS	1	1	1					1	1						
OS&H Standards for General Industry, OSHA 511 7/19-22/05	OS	10	3.5	35			1	1	8	5	1		1		3	
OS&H Standards for Construction Industry, OSHA 510 7/19-22/05	OS	2	3.5	7				2		2						
Update for Construction Industry Outreach Trainer, OSHA 502 8/2-4/05	OS	6	2.5	15				4	2	6						
Update for General Industry Outreach Trainer, OSHA 503 8/2-4/05	OS	15	2.5	37.5		1		12	2	14						1
Trainer Course for Construction Industry, OSHA 500 8/16-19/05	OS	8	3.5	28				6	2	7	1					
Trainer Course for General Industry, OSHA 501 8/16-19/05	OS	9	3.5	31.5				8	1	9						
Contractor/Supervisor Asbestos Abatement Refresher 9/22/05	OS	13	1	13			1		12	5	1	1	1	1	4	
OS&H Standards for General Industry, OSHA 511 10/11-13/05	OS	10	3.5	35				10		10						
OS&H Standards for Construction Industry, OSHA 510 10/25-28/05	OS	3	3.5	10.5				3		3						

Update for General Industry Outreach Trainer, OSHA 503 11/7-9/05	OS	12	2.5	30				10	2	10		2				
Trainer Course for Construction Industry, OSHA 500 11/7-11/05	OS	3	3.5	10.5				2	1	3						
Trainer Course for General Industry, OSHA 501 11/15-18/05	OS	8	3.5	28				6	2	7	1					
Trainer Course for Construction Industry, OSHA 500 11/5-18/05	OS	9	3.5	31.5				9		9						
Contractor/Supervisor Asbestos Abatement Refresher 12/2/05	OS	10	1	10			3	1	6	9			1			
Lead Supervisor/Contractor Refresher 12/2/05	OS	4	1	4			1	1	2	3					1	
Update for Construction Industry Trainers, OSHA 502 12/05-07/05	OS	3	2.5	7.5				3		3						
Trainer Course For Construction Industry Outreach Trainers, OSHA 500 12/5-9/05	OS	10	3.5	35				10		10						
Update for Construction Industry Trainers, OSHA 502 1/4-6/06	OS	6	2.5	15				6		6						
Update for General Industry Trainers, OSHA 503 1/4-6/06	OS	17	2.5	42.5				15	2	16		1				
OS&H Standards for General Indsutry, OSHA 511 1/10-13/06	OS	7	3.5	24.5				6	1	7						
Contractor/Supervisor Asbestos Abatement Refresher 1/27/06	OS	12	1	12			2	2	8	5					7	
Update For Construction Industry Outreach Trainers, OSHA 502 2/6-10/06	OS	2	2.5	5				2		2						
Trainer Course For Construction Industry Outreach Trainers, OSHA 500 2/6-10/06	OS	10	3.5	35				10		10						
Contractor/Supervisor Asbestos Abatement Refresher 2/17/06	OS	4	1	4			1	1	2	1					3	

Trainer Course For Construction Industry Outreach Trainers, OSHA 500 2/21-24/06	OS	5	3.5	17.5			1	4		5						
Trainer Course for General Industry Outreach Trainer, OSHA 501 2/21-24/06	OS	5	3.5	17.5				5		5						
Collateral Duty for Other Federal Agencies, OSHA 6000 2/27-3/2/06	OS	3	3.5	10.5			1		2		1		1			1
Risk Assessment Workshop 3/11-25/06	OS	7	3.5	24.5					7					7		
Update For Construction Industry Outreach Trainers, OSHA 502 3/22-24/06	OS	5	2.5	12.5				5		5						
Update for General Industry Outreach Trainers, OSHA 503 3/22-24/06	OS	8	2.5	20				6	2	6		1			1	
Southwest Ohio Regional Preparedness Workshop 3/23-24/06	OS	57	1	57	6	3		26	22	3		21	31		2	
Trainer Course for General Industry Outreach Trainer, OSHA 501 4/4-7/06	OS	9	3.5	31.5				9		7		1			1	
Contractor/Supervisor Asbestos Abatement Refresher 5/19/06	OS	4	1	4			1	3		3					1	
OS&H Standards for Construction Industry, OSHA 510 5/23-26/06	OS	3	3.5	10.5				3		3						
Trainer Course for General Industry Outreach Trainer, OSHA 501 6/27-30/06	OS	3	3.5	10.5				3		3						
Trainer Course for Construction Industry Outreach Trainer, OSHA 500 6/27-30/06	OS	5	3.5	17.5				5		5						
Bloodbourn Pathogen Training (web based)	OS	1640	0.125	205	320	150			1170						1640	
Subtotal [Program]	OS	1,959	104	985	326	154	12	210	1,257	218	5	27	35	8	1,663	3

Program Area: Other

					# Trainees by Profession					# Trainees by Employer						
Course/Seminar Title[1]	**Program Area**	**Total Trainees**	**Length of Course**	**Total Pers Days**	**MD**	**NURS**	**HYG**	**SAFETY**	**OTHER**	**Private Industry**	**Fed Gov**	**State Gov**	**Local Gov**	**Foreign Country**	**Acad emic**	**Other**
Lead Clearance/Sampling Technician 7/1/05	OT	15	1	15					15	15						
Lead Safe Renovator 9/20-21/05	OT	14	1	14					14	14						
Essential Maintenance Practices Training Program 9/20-21/05	OT	15	1	15					15	15						
Essentials of Health Housing: Health Homes Practioner Course 10/3/05	OT	12	1	12					12							12
Lead Worker Training 10/10-13/05	OT	13	4	52					13	13						
Lead Clearance/Sampling Technician 10/14/05	OT	11	1	11					11	11						
Essential Maintenance Practices Training Program 10/18-19/05	OT	16	1	16					16			1	1			14
Ergonomics of Occupational Hand-Arm & Whole Body Vibration (NIOSH 596) 10/27-28/05	OT	4	2	8			1	1	2	4						
Lead Safe Renovator 11/15-16/05	OT	14	1	14					14			1				13
Essential Maintenance Practices Training Program 11/15-16/05	OT	14	1	14					14			1				13
Essentials of Health Housing: Health Homes Practioner Course 12/5-6/05	OT	26	2	52		1			25				1			25
Lead Clearance/Sampling Technician 1/6/06	OT	7	1	7					7							7
Asbestos Abatement Awareness Training 2/3/06	OT	18	1	18				2	16						18	

Essentials of Health Housing: Health Homes Practioner Course 2/14-16/06	OT	48	2	96		28	1		19	22	3	3	15		5	
Lead Worker Training 2/27-3/2/06	OT	14	4	56					14							14
Lead Clearance/Sampling Technician 3/3/06	OT	13	1	13					13							13
Essential of Housing: Healthy Homes Practitioner Course 3/6-7/06	OT	14	2	28				1	13							14
Essential of Housing: Healthy Homes Practitioner Course 3/8-9/06	OT	3	2	6					3				3			
Lead Safe Renovator 3/29/06	OT	3	1	3					3							3
Essential Maintenance Practices Training Program 3/30/06	OT	3	1	3					3							3
Asbestos Operations & Maintenance 4/11,13/06	OT	5	2	10					5							5
Lead Worker Training 5/12-19/06	OT	9	4	36					9	9						
Lead Worker Training 5/22-26/06	OT	12	4	48					12							12
Essentials of Health Housing: Health Homes Practioner Course 6/1-2/06	OT	9	2	18					9							9
Lead Clearance/Sampling Technician 6/9/06	OT	11	1	11					11							11
Lead Clearance/Sampling Technician 3/3/06	OT	13	1	13					13							13
Asbestos Abatement Worker Training 6/27-7/11/06	OT	11	4	44					11							11
Subtotal [Program]	OT	347	49	633	0	29	2	4	312	103	3	6	20	0	23	192

ERC Applicant Institution: University of Cincinnati
Program Director: Judy L. Jarrell, Ed.D.

Table 12b
Summary of CE Course Offerings by Program Area
Current Budget Period: July 1, 2005 to June 30, 2006

					# Trainees by Profession					# Trainees by Employer						
Course/Seminar Title[1]	Program Area	Total Trainees	Total # of Courses	Total Pers Days	MD	NURS	HYG	SAFETY	OTHER	Private Industry	Fed Gov	State Gov	Local Gov	Foreign Country	Academic	Other
Subtotal IH	IH	282	23	324	1	0	96	27	158	183	13	10	13	3	54	6
Subtotal OHN	OHN	407	21	579	10	192	14	116	75	197	123	14	6	0	1	66
Subtotal OMR	OMR	294	9	153	89	18	0	0	187	75	6	28	5	0	3	177
Subtotal OS	OS	1,959	39	985	326	154	12	210	1,257	218	5	27	35	8	1,663	3
Subtotal HST	HST															
Subtotal Ag S&H	Ag S&H															
Subtotal Other Category	OT	347	27	633	0	29	2	4	312	103	3	6	20	0	23	192
GRAND TOTALS (All Program Areas)		3,289	119	2,674	426	393	124	357	1,989	776	150	85	79	11	1744	444

Refer to: Supplemental Instructions, page 10.
[1] Group together by Program Area and provide sub-totals for each Program Area.

APPENDIX C
PUBLICATIONS BY PROGRAM AREA OF FACULTY AND TRAINEES DURING THE REPORTING PERIOD THAT HAVE RESULTED, IN WHOLE OR PART, FROM ERC TRAINING GRANT SUPPORT.

(Trainee Authors are Underlined)

Table 1 Pilot Research Project Presentations and Manuscripts 2005-2006

Name	Presentation or Manuscript
Mustafa Al-Zoughool Glenn Talaska, PhD University of Cincinnati	Publications: Al-Zoughool, Succop, Paul, Desai, Pankaj, Vietas, Jay and Talaska, Glenn. "Effect of N-glucuronidation on Urinary Bladder Genotoxicity of 4-Aminobiphenyl in Male and Female Mice
Anthony Arment, PhD Central State University	Presentations: Arment, A., Overton, M. "Use of E-Beam Technology to Produce Bacteriocidal Silver-Fabric Composites". Undergraduate Research Symposium XV. Puerto Rico.
Dianne M. Felblinger, EdD, MSN, WHNP-C, CNS University of Cincinnati	Publications: Felblinger, D. M. & Gates, D. (2005 in process). Violence Against Women: Incivility, Bullying & Shame. Felblinger, D. M. & Gates, D. (2005 in process). Domestic Violence Screening and Treatment in the Workplace.
Donna Gates, EdD, RN, FAAN	Publications: Gates, D., Ross, C., & McQueen, L. (October, 2006). Violence against emergency department workers. *Journal of Emergency Medicine, 31(3) 331-337.* Gates, D. & Jones, S. (submitted) Preventing hearing loss in farmers: An intervention study. *Journal of Agromedicine*
Jennifer Gillespie Bowling Green State University	Presentations: Gillespie, J.Z. (October 28, 2005) "Emotional Labor Training for Direct Care Providers of People With Dementia". Brown Bag conducted at Purdue University, West Lafayette, Indiana
Chunhui He University of Cincinnati	Presentations: He, C. (May 2006) "Body Type Impact on Whole Body Kinematics During Material Handling", AIHCE, Chicago, Illinois
Scott Hutton University of Cincinnati	Presentations: Hutton, S. (April 30 – May 3, 2006) "Workplace Incivility Among Staff and Losses in Productivity". Midwest Nurse's Research Society. Minneapolis, Minnesota Hutton, S. (March 17 – 18, 2006) "Workplace Incivility Among Staff and Losses in Productivity". Ohio Association of Occupational Health Nurses State Conference. Cincinnati, Ohio Hutton, S. (March 17-18, 2006) "Workplace Incivility, What is it and Why Do We Care?." VA Medical Center. Cincinnati, Ohio Hutton, S. (October 20-21, 2005) "Workplace Incivility Among Staff and Losses in Productivity", 2005 PRP Symposium, University of Cincinnati Hutton, S. (October 15, 2005) "Workplace Incivility". The State of the Science Nurse Physician Collaborative, Cincinnati, Ohio
Yulia Iossifova University of Cincinnati	Presentations: Iossifova, Yulia (May 2006). House Dust (1-3)–*B*-D-Glucan and Wheeze in Infants. American Thoracic Society International Conference. San Diego, California May 2006

Laurel D. Kincl University of Cincinnati	Publications: Kincl, L.D., Dietrich KN and Bhattacharya, A, (October 2006) Injury Trends for Adolescents with Early Childhood Lead Exposure, Journal of Adolescent Health 39(4): 604-606 October 2006
Taekhee Lee University of Cincinnati	Publications: Lee, T., Relationship between indoor and outdoor airborne fungal spores, pollen, and (1→3)-β-D-Glucan in homes without visible mold growth." *Aerobiologia* 22(3), 227-235.
MingMing Lu, PhD University of Cincinnati	Presentations: Lamichhane, P., Lu, M., Liang, F., and Imerman, E.,(June 5-8, 2006) "Compositional Identification of Odor Causing Compounds in A Diary Farm", National Workshop on Agricultural Air Quality: State of the Science, Washington, D.C. Lu, M. (January 18-19, 2006) "The sampling and analysis of odor causing compounds in a dairy farm in Ohio", 3rd Agricultural Air Quality Symposium, Ohio State University
Sobeih, T. University of Cincinnati	Sobeih T, Davis K, Succop PA, Jetter WA, and Bhattacharya A. (2006) Postural Balance Changes in On-Duty Firefighters: Effect of Gear and Long Work Shifts, Journal of Occupational and Environmental Medicine. 48:68-75, 2006.
Jennifer Yugo Bowling Green State University	Presentations: Clark, O. L., Burnfield, J. L, Barger, P. B, Broadfoot, A., Yugo, J. E., Jex, S. M. (2005). Outcomes of Abusive Supervision: The Mediating Role of Organization-Based Self-Esteem. Poster presented at the 2005 APA Annual Convention, Washington, D.C. Clark, O. L., Burnfield, J. L., Broadfoot, A., Yugo, J. E., Jex, S. M. (2005). Incivility and Work Attitudes: The Mediating Role of Appraisal. Poster presented at the 2005 APA Annual Convention, Washington, D. C. Highhouse, S.E., Brooks, M.E., & Yugo, J.E. (2005). Role of "Warm Glow" Heuristic in Corporate Reputations. Poster presented at the 2005 Society for Judgment and Decision-making Conference, Toronto, Canada. Yugo, J.E., & Reeve, C.L. (May 2006) Organizational Image Goes to School: Testing a Method of Image Assessment with Universities. Paper to be presented at the 21st annual conference of the Society for Industrial Organizational Psychology, Dallas, Texas. Jex, S.M., Burnfield, J.L., & Yugo, J.E. (March 2006). Moderators of the effects of customer-based incivility on psychological health. Paper part of symposium to be conducted at the Work, Stress, and Health 2006: Making a Difference in the Workplace Conference. Miami, Florida. Yugo, J.E. (February 2006). The role of work meanings in recruitment. A paper to be presented at the IOOB annual conference. Fairfax, Virginia. Yugo, J.E. (February 2006). Predictors of youth farm safety. A paper to be presented at the IOOB annual conference. Fairfax, Virginia.

	Yugo, J.E., & McInroe, J. (February 2006). Achieving through meaning: how do work meanings affect our goals? A paper to be presented at the IOOB annual conference. Fairfax, Virginia. Highhouse, S.E., Brooks, M.E., & Yugo, J.E. (November 2005). Role of "Warm Glow" Heuristic in Corporate Reputations. Poster presented at the annual Society for Judgment and Decision-making Conference, Toronto, Canada.

University of Cincinnati Publications and Presentations
Industrial Hygiene

Publications (Program student name is underlined; name of student supported by NIOSH funds during any portion of their training underlined and marked with asterisks).

Adhikari A, Reponen T, Grinshpun S, Martuzevicius D, LeMasters G. 2006. Correlation of ambient inhalable bioaerosols with particulate matter and ozone: a two-year study. Environmental Pollution. 140: 16-28.

Adhikari A, Reponen T, Grinshpun S, Martuzevicius D, LeMasters G. 2006. Correlation of ambient inhalable bioaerosols with particulate matter and ozone: a two-year study. Environmental Pollution. 140: 16-28.

Agranovski IE, Huang R, Pyankov OV, Altman IS, Grinshpun SA. 2006. Enhancement of the performance of low-efficiency HVAC filters due to continuous unipolar ion emission. Aerosol Science and Technology. In press.

Agranovski IE, Safatov AS, Pyankov OV, Sergeev AA, Sergeev AN, Grinshpun SA. 2005. Long-term sampling of viable airborne viruses. Aerosol Science and Technology. 39(9): 912-918.

Al-Zoughool M, Talaska G. 2005. High performance liquid chromatography method for determination of N-glucuronidation of 4-aminobiphenyl by mouse, rat and human liver microsomes. Anal Biochem. 340: 352-358.

Baccarelli A, Khmelnitskii O, Tretiakova M, Gorbanev S, Lomtev A, Klimkina I, Tchibissov V, Averkina O, Rice C, Dosemeci M. 2006. Risk of lung cancer from exposure to dusts and fibers: an autopsy-based case-control study in the Leningrad province, Russia. American Journal of Industrial Medicine. 49:460-467.

Balazy A, Toivola M, Reponen T, Podgorski A, Zimmer A, Grinshpun SA. 2006. Manikin-based performance evaluation of N95 filtering facepiece respirators challenged with nanoparticles. Annals of Occupational Hygiene. 50: 259-269.

Balazy A, Toivola M, Adkihari A, Sivasubramani SK, Reponen T, Grinshpun SA. 2006. Do N-95 respirators provide 95% protection level against airborne viruses and how adequate are surgical masks? American Journal of Infection Control. 34:51-57.

Balazy A, Toivola M, Adhikari A, Sivasubramani SK, Reponen T, Grinshpun SA. 2006. Do N-95 respirators provide 95% protection level against airborne viruses and how adequate are surgical masks. American Journal of Infection Control. 34: 51-57.

Balazy A, Toivola M, Martuzevicius D, Podgorski A, Grinshpun SA. 2005. Experimental investigation of the variability in the protection characteristics provided by identical N95 respirators. Research and Standardization in the Field of Development and Use of Personal Protective Equipment. 63-67.

Bhattacharya A, Shukla R, Dietrich K, Bornschein R. 2006. Effect of early lead exposure on the maturation of children's postural balance: a longitudinal study. Neurotoxicology and Teratology. 28: 376-385.

Bhattacharya A, Habes D, Dewees J. 2006. Workplace related lower extremities disorders: workplace adaptations with case studies. Musculoskeletal Disorders in the Workplace, 2nd ed., Chapter 8e. In press.

Biagini JM, LeMasters G, Ryan PH, Levin L, Reponen T, Burkle J, Lockey J. 2006. Allergic Rhinitis in early infancy: is it environmental tobacco smoke or mold? Pediatric Allergy and Immunology. 17: 278-284.

Burton N, Grinshpun SA, Reponen T. Physical collection efficiency of filter materials for bacteria and viruses. Annals of Occupational Hygiene. In press.

Campo P, Kalra HK, Levin L, Reponen T, Olds R, Lummus ZL, Cho SH, Hershey GK, Lockey J, Villareal M, Stanforth S, LeMasters G, Bernstein DI. Influence of Dog Ownership and High Endotoxin on Wheezing and Atopy During Infancy. The Journal of Allergy and Clinical Immunology. Accepted.

Carreón T, Butler MA, Ruder AM, Waters MA, Davis-King KE, Calvert GM, Schulte PA, Sanderson PA, Ward EM, Connally LB, Heineman EF, Mandel JS, Morton RF, Reding DJ, Rosenman KD, Talaska G. 2005. Gliomas and farm pesticide exposure in women. Environmental Health Perspectives. 13: 546-551.

Chew GL, Wilson J, Rabito FA, Grimsley F, Iqbal S, Reponen T, Muilenberg ML, Thorne PS, Dearborn DG, Morley RL. 2006. Mold and endotoxin levels in the aftermath of Hurricane Katrina: a pilot project of homes in New Orleans undergoing renovation. Environmental Health Perspectives. In press.

Cho SH, Seo SC, Schmechel D, Grinshpun SA, Reponen T. 2005. Aerodynamic characteristics and respiratory deposition of fungal fragments. Atmospheric Environment. 39: 5454-5465.

Cho SH, Reponen T, Bernstein DI, Olds R, Levin L, Liu X, Wilson K, LeMasters G. The effect of home characteristics on dust antigen concentrations and loads in homes. Science of the Total Environment. Accepted.

Cho SH, Reponen T, LeMasters G, Levin L, Huang J, Meklin T, Villareal M, Bernstein DI. 2006. Mold damage in homes and wheezing in infants. Annals of Allergy, Asthma and Immunology. In press.

Davis KG, Marras WS. 2005. Load spatial pathway and spine loading: how does lift origin and destination impact low back response. Ergonomics. 48(8): 1031-1046.

Davis KG, Seol H. 2005. Injury-Induced Kinematic Compensations Within the Low Back: Impact of Non-Low Back Injuries. Ergonomics. 48(2): 135-149.

Davis KG, Jorgensen JM. 2005. Pro and Cons of Job Rotation as a Means of Reducing Injury Costs. Journal of Occupational and Environmental Hygiene. 2: D1-D3.

Davis KG, Jorgensen MJ. 2005. Biomechanical Modeling for Understanding of Low Back Injuries: A Systematic Review. Occupational Ergonomics. 5(1): 56-76.

Dixon SL, Wilson J, Clark CS, Galke W, Succop P, Chen M*. 2005. Effectiveness of lead-hazard control interventions on dust lead loadings: Findings from the evaluation of the HUD Lead-Based Paint Hazard Control Program. Environmental Research. 98: 303-314.

Davis KG, Kotowski SE*. 2005. Preliminary Evidence of the Short-Term Effectiveness of Alternative Treatments for Low Back Pain. Technology and Health Care. 13(6): 453-456.

Dixon S, Wilson J, Clark CS, Galke W, Succop P, Chen M*. 2005. The Influence of Common Area Lead Hazards and Lead Hazard Control on Dust Lead Loading in Multi-Unit Buildings. Journal of Occupational and Environmental Hygiene. 2: 659-666.

Fischer JM, Robbins, SB, Al-Zoughool M, Kannamkumarath SS, Stringer SL, Larson JA, Caruso JA, Talaska G, Stambrook PJ, Stringer JR. 2005. Co-mutagenic activity of arsenic and benzo[a]pyrene in mouse skin. Mut Res. 558: 35-46.

Galke W, Clark S, McLaine P, Bornschein R, Wilson J, Succop P, Roda S, Breysse J, Jacobs D, Grote J, Menrath W, Dixon S, Chen M*, Buncher R. 2005. National Evaluation of the US Department of Housing and Urban Development Lead-Based Paint Hazard Control Grant Program: Study Methods. Environmental Research. 98: 315-328.

Grinshpun, SA, Buttner MP, Willeke K. 2006. Sampling of Airborne Microorganisms. Manual of Environmental Microbiology, 3rd ed. In press.

Hou Y, Zurada JM, Karwowski W, Marras WS, Davis KG. 2006. Identification of Input Variables using Fuzzy Average with Fuzzy Cluster Distribution. IEEE Transactions on Fuzzy Systems. In press.

Hou Y, Zurada JM, Karwowski W, Marras WS, Davis KG. 2006. Estimation of the Dynamic Spinal Forces Using a Recurrent Fuzzy Neural Network Model. IEEE Transactions on Systems, Man, Cybernetics, Part B. In press.

Hu S, McDonald R, Martuzevicius D, Biswas P, Turner JR, Grinshpun SA, Kelley A, Reponen T, Lockey J, LeMasters G. 2006. UNMIX modeling of ambient PM2.5 near an interstate highway in Cincinnati, Ohio, USA. Atmospheric Environment. In press.

Kincl LD*, Dietrich KN, Bhattacharya A. 2006. Injury Trends for Adolescents with Early Childhood Lead Exposure. Journal of Adolescent Health. In press.

Jorgensen MJ, Davis KG, Kotowski S*, Aedla P, Dunning K. 2005. Characteristics of Job Rotation in the Midwest U.S. Manufacturing Sector. Ergonomics. 48(15): 1721-1733.

Kotowski S*, Davis K. 2005. The Importance of the "Human" in the Identification of Postural Risk Factors for Musculoskeletal Disorders. Journal of Occupational and Environmental Hygiene. 2(12): 100-101.

Kotowski SE*, Davis KG, Shockley K. 2005. Impact of Order and Visual Cues on Trunk Kinematics During Repeated Lifting Tasks. Human Factors. In review.

Lee SA, Adhikari A, Grinshpun SA, McKay R, Shukla R, Li H, Reponen T. 2005. Respiratory protection provided by N95 respirators against dust and microorganisms in agricultural farms. Journal of Occupational and Environmental Hygiene. 2: 577-585.

Lee SA, Adhikari A, Grinshpun SA, McKay R, Shukla R, Reponen T. 2006. Exposure to airborne dust and microorganisms in agricultural environments. Journal of Occupational and Environmental Hygiene. 3: 118-130.

Lee T, Grinshpun S, Martuzevicius D, Adhikari A, Crawford C*, Luo J, Reponen T. 2006. Relationship between indoor and outdoor bioaerosols collected with inhalable aerosol sampler in urban homes. Indoor Air. 16: 37-47.

Lee T, Grinshpun SA, Martuzevicius D, Adhikari A, Crawford C*, Reponen T. 2006. Cultureability and concentration of indoor and outdoor airborne fungi in six single-family homes. Atmospheric Environment. 40: 2902-2910.

Lee T, Grinshpun SA, Kim KY, Iossifova Y, Adhikari A, Reponen T. 2006. Relationship between indoor and outdoor airborne fungal spores, pollen, and (1-3)-B-D-glucan in homes without visible mold growth. Aerobiologia. Accepted.

Lee SA, Adhikari A, Grinshpun SA, McKay R, Shukla R, Li H, Reponen T. 2005. Respiratory protection provided by N95 respirators against dust and microorganisms in agricultural farmers. Journal of Occupational and Environmental Hygiene. 2: 577-585.

Lee T, Grinshpun SA, Martuzevicius D, Adhikari A, Crawford C*, Luo J, Reponen T. 2006. Relationship between indoor and outdoor bioaerosols collected with inhalable aerosol sampler in urban homes. Indoor Air. 16: 37-47.

Lee SA, Adhikari A, Grinshpun SA, McKay R, Shukla R, Reponen T. 2006. Exposure to airborne dust and microorganisms in agricultural environments. Journal of Occupational and Environmental Hygiene. 3: 118-130.

Luo J, Shukla R, Adhikari A, Reponen T, Grinshpun SA, Zhang Q, LeMasters G. 2006. Estimating sampling frequency in pollen exposure assessment over time. Journal of Environmental Monitoring. 8: 955-962.

Mainelis G, Gorny R, Willeke K, Reponen T. 2005. Rapid counting of liquid-borne microorganisms by light scattering spectrometry. Annals of Agricultural and Environmental Medicine. 12: 141-148.

LeMasters G, Bhattacharya A, Borton E, Mayfield L. 2006. Functional Impairment and Quality of Life in Retired Workers of the Construction Trades. Experimental Aging Research. 32(2): 227-242.

Marras WS, Ferguson SA, Burr D, Davis KG, Gupta P. 2006. Functional Impairment as a Prediction of Spinal Loading. Spine. In press.

Nam J, Rice C, Gail M. 2005. Comparisons of asbestos exposure assessments by next-of-kin respondents, by an occupational hygienist and by a job-exposure matrix from the National Occupational Hazards. American Journal of Industrial Medicine. 47:443-450.

Niemeier RT*, Sivasubramani SK, Reponen T, Grinshpun SA. 2006. Assessment of fungal contamination in moldy homes: comparison of different methods. Journal of Occupational and Environmental Hygiene. 3: 262-273.

Niemeier RT*, Sivasubramani SK, Reponen T, Grinshpun SA. 2006. Assessment of fungal contamination in moldy homes: comparison of different methods. Journal of Occupational and Environmental Hygiene. 3: 262-273.

Osborne M*, Reponen T, Adhikari A, Cho SH, Grinshpun SA, Levin L, Bernstein DI, LeMasters G. 2006. Specific fungal exposures, allergic sensitization, and rhinitis in infants. Pediatric Allergy and Immunology. 17: 450-457.

Reponen T, Wang HX, Grinshpun SA. 2005. Effect of microbial contamination of water-based metalworking fluids on the aerosolization of particles and microbial fragments. Journal of ASTM International. 8: 1-7.

Rice C, Levin L, Borton E, Lockey JE, Lilbert TJ, LeMasters GK. 2005. Exposures to refractory ceramic fibers in manufacturing and related operations: a 10-year update. Occup Environ Hyg J. 2:262-473.

Rosenman K, Hertzberg V, Rice C, Reilly MJ, Aronchick J, Parker J, Regovich J, Rossman M. 2005. Chronic beryllium disease and sensitization at a beryllium processing facility. Environmental Health Perspectives. 113:1366-1374.

Ruder AM, Waters MA, Butler MA, Carreón T, Calvert GM, Davis-King KE, Schulte PA, Sanderson WT, Ward EM, Connally LB, Heineman EF, Mandel JS, Morton RF, Reding DJ, Rosenman KD, Talaska G, Group BCCS. 2006. Gliomas and farm pesticide exposure in men. Arch Environ Health. 59: 650:657.

Sobeih T, Davis K, Succop PA, Jetter WA, Bhattacharya A. 2006. Postural Balance Changes in On-Duty Firefighters: Effect of Gear and Long Work Shifts. Journal of Occupational and Environmental Medicine. 48: 68-75.

Sobeih TM, Davis KG, Succop P, Jetter W, Bhattacharya A. 2006. Postural Balance Changes During the Work Shift of Firefighters: A Pilot Study. Journal of Environmental and Occupational Medicine. 48(1): 68-75.

Talaska G, Ginsburg D, LaDow K, Puga A, Dalton T, Warshawsky D. 2006. Impact of Cyp1a2 or Ahr Gene Knockout in Mice: Implications for Biomonitoring Studies. Toxicol Letts. 162: 246-249.

Talbott NR, Bhattacharya A, Davis KG, Shukla R, Levin L. 2005. School of Backpacks: It's More Than Just a Weight Problem. International Journal of Industrial Ergonomics. In review.

Vesper SJ, McKingstry C, Haugland RA, Iossifova Y, LeMasters G, Levin L, Hershey GK, Villareal M, Bernstein DI, Lockey J, Reponen T. EPA relative moldiness index© as predictor of childhood respiratory illness. Journal of Exposure Analysis and Environmental Epidemiology. In press.

Vineis P, Talaska G, Al-Zoughool M, Malaveille C, Fiorini L, Schumann B, Vietas J, Peluso M, Munnia A, Bianchini M, Allegro G, Matullo G, Sacerdote C. 2006. Randomized controlled trial: effects of diet on DNA damage in heavy smokers. Mutagenesis. In press.

Wang H, Reponen T, Lee SA, White E, Grinshpun SA. 2006. Submicron size airborne endotoxin – a new challenge for bioaerosol exposure assessment in metalworking fluid environments. Journal of Occupational and Environmental Hygiene. Accepted.

Zhong W, Levin L, Reponen T, Hershey GK, Adhikari A, Shukla R, LeMasters G. 2006. Concentration of specific aeroallergens and pediatric asthma visits in Cincinnati area. Science of the Total Environment. In press.

Industrial Hygiene Presentations (Program student name is underlined; name of student supported by NIOSH funds during any portion of their training underlined and marked with asterisks).

Balazy A, Toivola M, Grinshpun SA. Do N95 Respirators Provide an Adequate Protection Against Nanoparticles? 2nd International Symposium on Nanotechnology and Occupational Health, Minneapolis, Minnesota. October, 2005.

Bhattacharya A, Succop P, Lu ML, Kincl L*. Workers' postural balance response on dry surface can predict their balance performance on slippery surface. American Industrial Hygiene Conference and Exposition, Chicago, IL. May, 2006.

Cecala A, Rice C, Clark CS. Overview of WHO ILO Control Guidance Sheets for Silica. Practical Methods for Silica Dust Controls, Beawar, Rajasthan, India. January, 2006.

Clark CS, Rice C. Conditions at Four Silica Facilities in the US. Practical Methods for Silica Dust Controls, Beawar, Rajasthan, India. January, 2006.

Clark S. Global Cooperation to Prevent Lead Poisoning of Present and Future Workers and Their Families from Lead-Based Paints. 2005 Annual Conference of the Asia Pacific Occupational Safety and Health Organization, Indonesia. September, 2005.

Clark S, Rice C. Conditions at Silica Flour Facilities in US – 1970s and Today. INDO-US Workshop on Practical Methods for Silica Dust Control 18-19, Beawar, Rajasthan, India. January, 2006.

Clark S. Capacity Building for International Occupational Safety and Health Research. Town Hall Meeting on National Occupational Research Agenda conducted by NIOSH and the University of Cincinnati Education and Research Center, Piqua, OH. March, 2006.

Couch J*, Rice C, Schubauer-Berigan M, Petersen M, Hornung R. Analysis of Beryllium Exposures at a Beryllium Manufacturing Facility. American Industrial Hygiene Conference and Exposition, Chicago, IL. May, 2006.

Davis KG, Marras WS. Are There Inherent Differences in How Males and Females Respond to Lifting. 2005 International Society of Biomechanics XXth Congress, Cleveland, OH. August, 2005.

Davis KG, Kotowski SE*, Jorgensen MJ. Development of a Multi-Joint Postural Exposure Assessment Tool for Job Rotation. Human Factors and Ergonomics Society 49th Annual Meeting, Orlando, Florida. September, 2005.

Dunning K, Davis KG, Jewel G, Lockey J. The relationship of age, diagnosis and industry on cost and disability: an analysis using a worker's compensation database. National Occupational Research Agenda 2006 Symposium, Washington D.C. April, 2006.

Grinshpun SA. Penetration of Single Aerosolized MS2 Viruses through Multilayer Fibrous Filters of N95 Respirators, European Aerosol Conference, Ghent, Belgium. September, 2005.

Grinshpun SA. Continuous Emission of Unipolar Ions in the Vicinity of a Low-efficiency HVAC Aerosol Filter Significantly Enhances the Filter Performance, European Aerosol Conference, Ghent, Belgium. September, 2005.

Grinshpun SA. Relationship Between Indoor and Outdoor Exposure to Airborne Fungi and Pollen in Single-Family Homes, 10th International Conference on Indoor Air Quality and Climate, Beijing, People's Republic of China. September, 2005.

Grinshpun SA. Performance of Fibrous Filters of N95 Respirators: What is the Most Penetrating Particle Size, Annual Meeting of the American Association for Aerosol Research, Austin, Texas. October, 2005.

Grinshpun SA. Formation of Nanoparticles in Indoor Air at an Increased Ozone Level, Annual Meeting of the American Association for Aerosol Research, Austin, Texas. October, 2005.

Grinshpun SA. Health Related Aerosols: Combining Aerosol Physics, Microbiology and Environmental Health, Technion – Israel Institute of Technology, Haifa, Israel. December, 2005.

Grinshpun SA. Recent Advances in Sampling of Airborne Viral Particles, 4th Asian Aerosol Conference, Mumbai, India. December, 2005.

Grinshpun SA. Ozone Generation as an Indoor Air Cleaning Method: Does it Actually Reduce the Aerosol Concentration Level?, 4th Asian Aerosol Conference, Mumbai, India. December, 2005.

Grinshpun SA. Nanoparticle Measurement and Filtration Effectiveness, Nanotechnology Symposium, American Industrial Hygiene Conference and Exposition, Chicago, Illinois. May, 2006.

Grinshpun SA. Technion – Israel Institute of Technology, Haifa, Israel. 2005.

Grinshpun SA, Agranovski IE, Pyankov OV. Continuous Emission of Unipolar Ions in the Vicinity of a Low-Efficiency HVAC Aerosol Filter Significantly Enhances the Filter Performance. European Aerosol Conference, Ghent, Belgium. August, 2005.

Grinshpun SA, Balazy A, Toivola M, Reponen T, Podgorski A. Performance of Fibrous Filters of N95 Respirators: What is the Most Penetrating Particle Size. 24th Annual Meeting of the American Association for Aerosol Research, Austin, Texas. October, 2005.

He C, Davis KG, Seol H. Impact of body type on whole-body kinematics during manual material handling tasks. American Industrial Hygiene Conference and Exposition, Chicago, Illinois. May, 2006.

Iossifova Y, Reponen T, Levin L, Zeigler H, Bernstein D, Kalra H, Hershey GK, LeMasters G. House dust (1-3)-b-D-glucan and wheeze in infants. Abstracts of the ATS 2006 Conference, San Diego, California. May, 2006.

Kotowski SE*, Davis KG, Waters TR. Do Ergonomic Interventions Effectively Mitigate Risk of Injury in Farm Kids When Shoveling. National Occupational Research Agenda 2006 Symposium, Washington D.C. April, 2006.

Kotowski SE*, Davis KG, Waters TR. A Potential Intervention for Low Back Pain for Farm Children When Shoveling. American Industrial Hygiene Conference and Exposition, Chicago, Illinois. May, 2006.

Kotowski SE*, Davis KG, Jorgensen M. Repeatability of an Exposure Assessment Method for Job Rotation. Human Factors and Ergonomics Society 49th Annual Meeting, Orlando, Florida. September, 2005.

Kotowski SE*, Shockley K, Davis KG. The Influence of Posture and Load Magnitude on Perceived Exertion During Lifting. American Industrial Hygiene Conference and Exposition, Chicago, Illinois. May, 2006.

Lee T, Grinshpun SA, Martuzevicium D, Adhikari A, Crawford C, Reponen T. Indoor and outdoor airborne fungi: viability and concentration in six moisture-free houses. Abstracts of the AIHCE 2006 Conference, Chicago, IL. May, 2006.

Meklin T, Haughland R, Vesper S, Cho SH, Grinshpun S, Nevalainen A, LeMasters G, Reponen T. Comparison of Fungal Profiles Obtained with PCR Analysis of Indoor Air, Outdoor Air, and Dust Samples. 10th International Conference on Indoor Air Quality and Climate, Beijing, China. September, 2005.

Muianga CV, Rice C. Checklists for Housekeeping and Cleaning to Control Dust Exposures in Small Scale Demolition. American Industrial Hygiene Conference and Exposition, Chicago, IL. May, 2006.

Reponen T. Bioaerosol sampling. Queensland University of Technology, Brisbane, Australia. August, 2005.

Reponen T, Cho SH, Lummus Z, Bernstein D, Olds R, Levin L, Satwah S, Grinshpun S, LeMasters G. Correlation of allergen levels in air and dust samples. Indoor Air 2005 Conference, Beijing, China. September, 2005.

Reponen T. Bioaerosols – new insights for exposure assessment. NIOSH, Morgantown, West Virginia. November, 2005.

Reponen T, Wang HX, Grinshpun SA. Airborne particles, microorganisms and endotoxin in metalworking fluid environments. 15th International Colloqium Tribology, Esslingen, Germany. January, 2005.

Reponen T. Bioaerosols – new insights for exposure assessment and control. INRS (French equivalent of NIOSH), Nancy, France. January, 2006.

Reponen T. State-of-the-art mold health effects: relevance of mold by-products, AAAAI 2006, Miami Beach, Florida. March, 2006.

Reponen T, Wang H, Grinshpun SA. Aerosolization of microbial contaminants and fine particles from metalworking fluids. NORA symposium 2006, Washington D.C. April, 2006.

Reponen T, Lee SA, McKay R, Shukla R, Grinshpun SA. Respiratory protection against bioaerosols in agriculture. NORA Symposium 2006, Washington D.C. April, 2006.

Reponen T, Cho SH, Lummus Z, Bernstein D, Olds R, Levin L, Satwah S, Grinshpun SA, LeMasters G. Correlation of Allergen Levels in Air and Dust Samples. 10th International Conference on Indoor Air Quality and Climate, Beijing, China. September, 2005.

Rice C, Blair A, Spritas R, Bernstein L, Stark AD, Heineman EF. What is the contribution of non-work related asbestos exposure to mesothelioma risk? International Occupational Hygiene Association 6th International Conference, Pilanesburg, South Africa. September, 2005.

Rice C. Interactive Training – bridging multiple campuses with technology. University of Alabama at Birmingham School of Public Health, Birmingham, AL. November, 2005.

Talbott NR, Bhattacharya A. Comparison of the perception of backpack weight with objective measurements. Annual Conference and Exposition of the American Physical Therapy Association, Boston, MA. June, 2005.

Talbott NR, Bhattacharya A, O'Hara S, Adams T. Relationship between backpack wear and blood flow in the brachial artery. Annual Conference and Exposition of the American Physical Therapy Association, Boston, MA. June, 2005.

Talaska G. Biological Monitoring for Occupational Carcinogens. Alberta Society for Human Toxicology, Kananaskis, Alberta, Canada. March, 2006.

Veitas J, Schumann B, Talaska G. Impact of arsenic on benzo(a)pyrene-DNA binding-role of glutathione. American Industrial Hygiene Conference and Exposition, Chicago, Illinois. May, 2006.

Occupational Health Nursing Faculty and Student Publications and Other In-Print Documents, 2005-2006

A. 2005-2006 Refereed Publications

Barsevick, A., Whitmer, K., Nail, L., Beck, S., & Dudley, W. (2006). Symptom cluster research: Conceptual, design, measurement, and analysis issues. *Journal of Pain & Symptom Management,* 31, 85-95.

Beery, T. S., Baas, L. S., Matthews, H., Burroughs, J., & Henthorn, R. (2005). Development of the implanted devices adjustment scale. *Dimensions of Critical Care Nursing,* 24, 242-248.

Colella, C., & Laver, J. (2005). Setting the stage for changing health behavior. *The Nurse Practitioner,* 30, 68-70.

Cooper, L. (2005). New construction, renovation and remodeling: What school nurses have learned from planning new health office facilities. *The Journal of School Nursing,* 21, 170-175.

Corte, C., & Sommers, M. S. (2005). Alcohol and risk taking. *Annual Review of Nursing Research,* 23, 327-362.

Davis, L. S. (2005). Disabilities in the workplace. *AAOHN Journal, 53, 306-312.*

Hutton, S. (2006). Workplace incivility: State of the science. *Journal of Nursing Administration,* 36, 22-27.

Kalos, A., Kent, L., & Gates, D. (2005). Integrating MAPP, APEXPH, PACE-EH, and other planning initiatives in Northern Kentucky. *Journal of Public Health Management and Practice,* 11, 401-406.

Kemper, P., Savage, C., Niederbaumer, P., & Anthony, J. (2005). A study of the level of knowledge about diabetes management of low income persons with diabetes. *Journal of Community Health Nursing,* 22, 231-239..

Miller, K., Apold, S., Baas, L., Berner, B., & Brill, E. (2005). Job satisfaction among nurse practitioners. *Journal for Nurse Practitioners,* 1, 30-33.

Miller, K., Apold, S., Baas, L., Berner, B., & Brill, E. (2005). Practice patterns among a selected group of nurse practitioners. *Journal for Nurse Practitioners,* 1, 94-97.

Moore, L., & Miller, M. (2005). Driving strategies used by older adults with macular degeneration: Assessing the risks. *Applied Nursing Research,* 18, 110-116.

Palmer, K. M. (2006). Abdominal pain due to acute intermittent porphyria. *Dimensions of Critical Care Nursing,* 25, 103-109.

Nordmann, A., Nordmann, A., Briel, M., Keller, U., Yancy, W., Brehm, B., & Bucher, H. (2006). Effects of low-carbohydrate versus low-fat diets on weight loss and cardiovascular risk factors: A meta-analysis of randomized controlled trials. *Archives of Internal Medicine,* 166, 285-293.

Schweer, L., Cook, B., Bivens, K., Van Kuiken, *D.*, Garcia, V., & Falcone, R. (2006). Family perception: Quality of life following a child's traumatic injury. *Journal of Trauma Nursing,* 13, 6-16.

Sommers, M. S. (2005). Measurement of alcohol consumption: Issues and challenges. *Annual Review of Nursing Research,* 23, 27-64.

Sommers, M. S., Zink, T., *Baker, R. B.*, Fargo, J. D., Porter, J., Weybright, D., & Schafer, J. C. (2006). The affects of age and ethnicity on physical injury from rape. *Journal of Obstetrics, Gynecologic, and Neonatal Nursing, 35, 199-207.*

Stevenson, J. S., & Sommers, M. S. (2005). The case for alcohol research as a focus of study by nurse researchers. *Annual Review of Nursing Research,* 23, 3-26.

B. Refereed Manuscripts in Press as of June 30, 2006

Brehm, B., Breen, P., Brown, B., Long, L., Smith, R., Wall, A., & Warren, N. (In press). An innovative interdisciplinary approach to developing professionalism in health professions students. *Journal of Pharmaceutical Education.*

Dennison, R. D. (In press). Development, implementation, and evaluation of a medication safety education program. *Journal of Continuing Education in Nursing.*

Gates, D. M., Ross, C. S., & *McQueen, L.* (In press). Violence against emergency department workers. *Journal of Emergency Medicine.*

Savage, C. L., Xu, Y., Anthony, J. S., Rose, B., Kapesser, M., & *Lee, R. C.* (In press). A case study in the use of community-based participatory research in public health nursing. *Public Health Nursing.*

Sommers, M. S**.** (In press). Injury as a global phenomenon of concern to nursing science. *Journal of Nursing Scholarship.*

Sommers, M. S., Dyehouse, J. M., Howe, S. R., Fleming, M. F., Fargo, J. D., & Schafer, J. C**.** (In press). Effectiveness of brief interventions following alcohol-related vehicular injury: A randomized controlled trial. *Journal of Trauma, Infection, and Critical Care.*

Whitmer, K., Pruemer, J., Nahleh, Z., & Jazieh, A. (In press). Symptom management needs of oncology outpatients. *Journal of Palliative Medicine.*

Xu, Y., & Whitmer, K. (In press). What you need to know about C-reactive protein. *American Journal of Nursing*.

C. Peer-Reviewed Abstracts in Published in Refereed Journals

Brehm, B., Lattin, B., Spang, S., Boback, J., & D'Alessio, D. (2005). Effects of high monounsaturated fat and low fat diets on body weight, cardiovascular risk factors, and glycemic control in subjects with type 2 diabetes. *Journal of the American Dietetic Association*, 105(8S), S9.

McQueen, L., Gates, D., & Ross, C. (2005). Violence against emergency department workers. J*ournal of Emergency Nursing, 31, 427-428.*

Sommers, M. S., Fargo, J .D., & Lyons, M. (2006). Risk-taking and injury: Association of problem drinking, risky driving, and sleep deficit. *Alcoholism: Clinical and Experimental Research*.

Xu, Y.,Toobert, D., Savage, C., Pan, W., & Whitmer, K. (2006). Factors affecting diabetes self-management in Chinese people with type 2 diabetes. *Diabetes, 55* (S1), A433.

D. Books or Edited Journal Volumes

Armstrong, M., Feigenbaum, J., Savage, C., Snow, D., & Vourakis, C. (Eds.) (2006). *Addictions nursing, core curriculum, 2nd edition*. Raleigh, NC: International Nurses Society on Addiction.

Fitzpatrick, J., Stevenson, J., & Sommers, M. S. (2005). Alcohol use, misuse, abuse, and dependence. *Annual Review of Nursing Research, Volume 23.* New York: Springer.

E. Book Chapters and Electronic Media

Halperin, R., Lee, R. J., & Brown, L. (2006). Deterritorialization, crisis management, and the beginnings of reterritorialization. In R. Halperin (Ed.), *Whose school is it? Women, children, memory, and practice in the city* (pp.146-163). Austin, TX: University of Texas Press.

Hertz, J., & Baas, L. S. (2006). Self care model. In H. Erickson (Ed.), *Modeling and role modeling revisited*. Austin, TX: Unicorns Unlimited.

Savage, C. L. (2006). Health promotion and risk reduction. In M. Armstrong, J. Feigenbaum, C. Savage**,** D. Snow, & C. Vourakis (Eds.), *Addictions nursing, core curriculum 2nd edition* (4.1-4.15). Raleigh, NC: International Nurses Society on Addiction.

Savage, C. L., & Feigenbaum, J. (2006). Special population. In M. Armstrong, J. Feigenbaum, C. Savage, D. Snow, & C. Vourakis (Eds.), *Addictions nursing, core curriculum 2nd edition* (pp 7.1-7.63). Raleigh, NC: International Nurses Society on Addiction.

Sommers, M.S., & Bolton, P. (2006). Multisystem review. In J.G. Alspach (Ed.), *Core curriculum for critical care nursing, 6th edition* (pp. 753-847). St Louis, MO: Saunders-Elsevier.

Workman, L. (2005). Staff recruitment and retention. D. L. Huber (Ed.), *Leadership and nursing care management* (pp. 625-648). Philadelphia: Saunders-Elsevier.

F. Editorials, Special Columns, Book Reviews, and Other Publications

Miller, E. (2005). Disaster preparedness: Are we ready? *Rehabilitation Nursing,* 30, 214.

Miller, E. (2005). Merging rehabilitation nursing with complementary and alternative therapies. *Rehabilitation Nursing, 30,* 170, 172.

Miller, E. (2005). Embracing diversity to overcome health disparities. *Rehabilitation Nursing, 30,* 122, 139.

Part 2: Faculty and Graduate Student Presentations, 2005-2006

(graduate students underlined, poster presentations with *)

Baik, S. Y., & Bowers, B. Clinical experience in recognizing depression: What is it made of? Midwest Nursing Research Society, Milwaukee, WI, April 1, 2006.

Baker, R., Sommers, M. S., & Fargo, J. Variations in skin, mucous membrane, and vaginal wall color. Midwest Nursing Research Society, Milwaukee, WI, April 1, 2006.*

Beavers, A. Operating room staff and shap injuries: Protecting health. Ohio Association of Occupational Health Nurses Bi-annual Meeting, Mason, OH, March 17-18, 2006.*

Brehm, B**.** Safety and efficacy of low carbohydrate diets: Two clinical trials. Fall Colloquium, University of Northern Illinois, School of Nursing, October 19, 2005.

Brehm, B., Lattin, B., Spang, S., Boback, J., & D'Alessio, D. (2005). Effects of high monounsaturated fat and low fat diets on body weight, cardiovascular risk factors, and glycemic control in subjects with type 2 diabetes. Annual Meeting of the American Dietetic Association, St. Louis, MO, October, 2005.

Colella, C., & Laver, J. Teaching the art of brief intervention, Ohio Association of Advanced Practice Nurses, Columbus, OH, November, 2005.

Colella, C., & Laver, J. Teaching the art of brief intervention. National Organization of Nurse Practitioner Faculties 32nd Annual Meeting, Orlando, FL, April 20-23, 2006.*

Davis, LS. The economic impact of health promotion on presenteeism. Ohio Association of Occupational Health Nurses Bi-annual Meeting, Mason, OH, March 17-18, 2006.

Day, M. Transitional work programs: Keeping workers healthy and productive. Ohio Association of Occupational Health Nurses Bi-annual Meeting, Mason, OH, March 17-18, 2006.*

Fargo, J. D., Schafer, J. C., Sommers, M. S., & Lyons, M. Application of latent class analysis to determine screening item thresholds for participant inclusion/exclusion. Conference on New Directions in Psychological Measurement with Model-Based Approaches, Atlanta, GA, February, 2006.*

Felblinger, D. OSHA standard in reproductive care. 19th International Conference in Reproductive Medicine for Nurses and Support Personnel, Scottsdale, AZ, May 18-20, 2006.

Gates, D. Measuring the impact of presenteeism. Ohio Association of Occupational Health Nurses Bi-annual Meeting, Mason, OH, March 17-18, 2006.

Gillespie, G. L., Elam, M., & Singleton, M. An innovative EMS partnership to reduce emergency department throughput times. Annual Leadership Conference of the Emergency Nurses Association, Austin, TX, February, 2006*

Gillespie, G., Savage, C. L., Lee, R. J., & Corbin, A. The impact of dental health on homeless clients and a nurse run clinic. American Public Health Association, Philadelphia, PA, December, 2005.*

Hutton, S. & Gates, D. Workplace incivility among nursing staff and losses in productivity. Midwest Nursing Research Society, Milwaukee, WI, April 1, 2006.*

Hutton, S. Incivility in the Healthcare Workplace. Nurse Physician Collaborative (NCP), Cincinnati, OH, October 19, 2005

Jenson, M. A change for patient safety: Mandating defibrillators for intra-hospital transport of critically ill patients. Midwest Nursing Research Society, Milwaukee, WI, April 1, 2006.*

Lane, A. Classroom? Hybrid? On-Line: The voice of the customer. 24th Annual International Nursing Computer and Technology Conference. Toronto, Ontario, Canada, May 27, 2006.*

Laver, J., & Colella C. (2006). Brief intervention: Setting the stage for health behavior change. Ohio Emergency Nurses Association, Columbus, OH, April, 2006.

Laver, J., & Colella, C. (2005). Touch pad technology: Bringing the college classroom alive! International Society for Exploring Teaching & Learning, Cocoa Beach, FL, October, 2005.

Mangold, F., Sommers, M. S., & Kent, G. Harmful drinking, depression, and conduct disorder among females involved in alcohol-related motor vehicle crashes. Midwest Nursing Research Society, Milwaukee, WI, April 1, 2006.

Meyer, U. The history and background of presenteeism. Ohio Association of Occupational Health Nurses Bi-annual Meeting, Mason, OH, March 17-18, 2006.

Miller, E. Modifying risk factors of stroke: Strategies to change behavior. 2005 National Stroke Association Stroke Meeting, Orlando, FL, October 27, 2005.

Miller, E. Modifying risk factors of stroke: Strategies to change behaviors in the outpatient setting. 2005 Public Health Stroke Summit, National Stroke Association, Denver, CO, December 5-7, 2005.

O'Shaughnessy, S**.,** Sommers, M. S., & Elek, S. Prevalence of health behaviors in the emergency department population. Midwest Nursing Research Society, Milwaukee, WI, April 1, 2006.*

Rauf, S. Workplace violence prevention strategies. Ohio Association of Occupational Health Nurses Bi-annual Meeting, Mason, OH, March 17-18, 2006.*

Sommers, M. S. Building programs of scholarship. College of Nursing, Texas Women's University, Denton, TX, August 23, 2005.

Sommers, M. S**.** Building programs of research: Struggles, strategies, and successes. Annual Student Creative Arts and Research Symposium, Texas Women's University, Denton, TX, April 19, 2006.

Sommers, M. S. Pathway to discovery: Building on unexpected findings in injury research. Research Colloquium, School of Nursing, University of Pennsylvania, Philadelphia, PA, October 19, 2005.

Sommers, M. S. Patterns of genital injury after sexual assault: Definition, implications, and future directions. Violence Against Women and Women's Health National Scientific Meeting, University of Kentucky, Lexington, KY, June 7, 2006.

Sommers, M. S. Practitioner to scientist: Dreams, details, and supports. Edna Fritz Lecture, College of Nursing, The Ohio State University, Columbus, OH, May 6, 2006.

Sommers, M. S. Response to implementation of screening, brief intervention, and referral to treatment (SBIRT) in the emergency department population. International Conference on Alcohol and Injury: New Knowledge from Emergency Room Studies (Kettil Bruun Society). National Institute on Alcohol Abuse and Alcoholism, World Health Organization, and Centers for Disease Control and Prevention, Berkeley, CA, October 6, 2005.

Sommers, M. S., Fargo, J. D., & Lyons, M. (2006). Risk-taking and injury: Association of problem drinking, risky driving, and sleep deficit. Research Society on Alcoholism Annual Conference, Baltimore, MD, June 26, 2006.*

Sommers, M. S., Lyons, M., Howe, S. R., Schafer, J. C., & Fargo, J. D. Problem drinking and risky driving in a vulnerable population. Midwest Nursing Research Society, Milwaukee, WI, April 1, 2005.

Sommers, M. S., Lyons, M., Schafer, J. C., Fargo, J. D., & Howe, S. R. Prevalence of risky driving and problem drinking behaviors in ED patients. Association for the Advancement of Automotive Medicine Annual Conference, Boston, MA, September 13, 2005.

Van Kuiken, *D.*, & Gerhardt, W. Strategies for increasing response rate on electronic survey**.** Midwest Nursing Research Society, Milwaukee, WI, April 1, 2006.*

Van Kuiken, *D.*, Gerhardt, W., & Lin, L. Structural relationships in a nurse job satisfaction model**.** Midwest Nursing Research Society, Milwaukee, WI, April 1, 2006.*

Wilson, W. Patient safety. IPGE Kiawah Island Meeting, NE, May 5, 2006.

Grants Submitted with significance to Occupational Health Nursing			
Submission Date	Status	Grant/Project; Name of CON Principal Investigator	Funding Source
07-01-05	Research Grant Not funded	Motivating minority pregnant women to exercise (Elek, Dyehouse, Moss, Shambley-Ebron)	National Institute of Nursing Research
07-01-05	Research Grant For resubmission	Injury from sexual assault: Addressing health disparity (Sommers, Schafer, Shambley-Ebron)	National Institute of Nursing Research
07-01-05	Research Grant For resubmission	Respiratory protection against bioaerosols in agriculture (Gates, Co-PI; PI: Reponen, Environmental Health)	Centers for Disease Control and Prevention
08-01-05	Research Grant Funded	Reducing health disparities in the sexual assault exam using fluorescence imaging (Sommers; PI: Sullivan of BCC Group LLC)	National Institutes of Health Small Business Innovation Research
09-14-05	Research Grant Not funded	Center for excellence to promote a healthier workforce (Davis, Gates)	National Institute of Occupational Safety and Health
09-15-05	Research Grant Funded	Management of skin toxicities following biotherapy (Whitmer)	Oncology Nursing Society
10-07-05	Training Grant Not funded	Critical skills curriculum for health professions trainees and prescribers (Gevedon, Baas; PI: Kues, College of Medicine)	Attorney General Consumer and Prescriber Education Grant Program
11-01-05	Research Grant Not funded	School-based prevention of type 2 diabetes in minorities (Dyehouse; PI: Morrison, CCHMC)	National Institute of Diabetes, Digestive, and Kidney Diseases
11-01-05	Research Grant Not funded	Comparison of responses of two types of radiation therapy for breast cancer (Dienger)	Oncology Nursing Society
11-14-05	Training Grant For resubmission	PhD level nursing education (Pettigrew, Lane)	Department of Education
12-01-05	Program Grant Pending	Advanced education nursing traineeship (Sommers for College of Nursing)	Health Services and Resources Administration
12-01-05	Program Grant Pending	Summer PhD program (Elek)	Health Services and Resources Administration
02-01-06	Research Grant Pending	Motivational interviewing to reduce health disparities (Elek; PI: Krummel, Allied Health)	National Institutes of Health
02-01-06	Research Grant Pending	Women's rehabilitation experience following breast cancer surgery (Reigle)	Association of Rehabilitation Nurses
02-24-06	Program Grant Funded	Breast cancer screening in Southeast Indiana (Lane, Martin)	Komen Foundation
02-24-06	Program Grant Not funded	Women's focus on fitness program (Reigle)	Komen Foundation
03-01-06	Research Grant Pending	Respiratory protection against bioaerosols in agriculture (Gates, Co-P; PI: Reponen, Environmental Health)	National Institutes of Health
03-01-06	Research grant Pending	Effectiveness of weight loss on improving workers' musculoskeletal health (Gates, Baas, Brehm: PI: Davis, Environmental Health)	National Institutes of Health
03-07-06	Research grant Not funded	Partnering to control obesity with environmental changes in schools (Gates, Brehm)	Robert Wood Johnson Foundation
04-27-06	Cooperative Agreement Pending	Developing community partners to implement SBIRT (Dyehouse; PI: Hamilton County Alcohol and Drug Addiction Services Board	Substance Abuse and Mental Health Services Administration
05-17-06	Research grant Pending	Partnering to prevent hearing loss in farmers (Gates)	National Institutes of Health
05-17-06	Research grant	Partnering with manufacturing to reduce obesity	National Institutes of

	Pending	and related disease risk (Gates, Brehm, Baas)	Health
05-17-06	Research grant Pending	Breaking the cycle of violence (Morris; PI: King, Allied Health)	National Institutes of Health
06-01-06	Research grant Pending	Novel health protection program for firefighters (Baas; PI: Bhattacharya, Environmental Health)	National Institutes of Occupational Health and Safety
06-01-06	Research grant Pending	School-based intervention to prevent obesity (Brehm: PI: Sharma, College of Education)	National Institutes of Health
06-15-06	Research grant Pending	School-based intervention to prevent obesity Brehm: PI: Sharma, College of Education)	Department of Agriculture

TOTAL REQUESTS SUBMITTED in AY 2006 FOR EXTRAMURAL FUNDING - $14,418,392

University of Cincinnati ERC
Occupational Medicine Publications 2005-06

Adhikari A, Reponen T, Grinshpun SA, Martuzevicius D, LeMasters G. Correlation of ambient inhalable bioaerosols with particulate matter and ozone: a two-year study. Environ. Pollut 140:16-28 (2006)

Biagini JM, LeMasters G, Ryan PH, Levin L, Reponen T, Bernstein DI, Villareal M, Khurana GK, Burkle J, Lockey J. Environmental risk factors of rhinitis in early infancy. Pediatr Allergy Immunol 17:278-84 (2006)

Carreon T, Ruder AM, Schulte PA, Hayes RB, Rothman N, Waters M, Grant DJ, Boissy R, Bell DA, Kadlubar FF, Hemstreet GP. Yin S, LeMasters G. NAT2 slow acetylation and bladder cancer in workers exposed to benzidine. Int J Cancer 1: 161-8 (2006)

Jewell G, Dunning K, Lockey J. Alleged B. anthracis exposure claims in a workers' compensation setting. Public Health Rep 121:255-61 (2006)

Lee SA, Adhikari A, Grinshpun SA, McKay R, Shukla R, Zeigler HL, Reponen T. Respiratory protection provided by N95 filtering facepiece repirators against airborne dust and microorganisms in agricultural farms. J Occup Environ Hyg 2:577-85 (2005)

Lee SA, Adhikari A, Grinspun SA, McKay R, Shukla R. Personal exposure to airborne dust and microorganisms in agricultural environments 3: 118-30 (2006)

LeMasters G, Bhattacharya A, Borton E, M ayfield L. Functional impairment and quality of life in retired workers of the construction trades. Exp Aging Res 32:227-42 (2006)

Panlilio AL, Cardo DM, Grohskopf LA, Heneine W, Ross CR,. Updated U.S. Public Health Service guidelines for the management of occupational exposures to HIV and recommendations for postexposure prophylaxis MMWR Recomm Rep 54 (RR-9):1-17 (2005)

Ryan PH, LeMasters G, Biagini J, Bernstein D, Grinshpun SA, Shukla R, Wilson K, Villareal M, Burkle J, Lockey J. Is it traffic type, volume, or distance? Wheezing in infants living near truck and bus traffic. J Allergy Clin Immunol 116:279-84 (2005)

Rice CH, Levin LS, Borton EK, Lockey J, Hilbert TJ, LeMasters G. Exposures to refractory ceramic fibers in manufacturing and related operations: a 10-year update. J Occup Environ Hyg 2:462-73 (2005)

OSHE Student Publications with Faculty, and Faculty Publications*

Acosta-Leon AL, Grote BP, Salem S, Daraiseh N. Risk factors associated with adverse health and safety outcomes in the US Hispanic workforce. *Theoretical Issues in Ergonomics Sciences* 2006; 7(3): 299-310.

Abdallah A, Genaidy AM, Karwowski W, Shell R, Sonbol A, Ravelo E, Holley MB. Theoretical basis for general lifting equations based on mechanical work performed during manual lifting. *Theoretical Issues in Ergonomics Sciences* 2005; 6(6):551-564.

Barriera-Viruet H, Sobeih TM, Daraiseh N, Salem S. Questionnaires vs observational and direct measurements: a systematic review. *Theoretical Issues in Ergonomics Sciences* 2006; 7(2): 261-284.

Genaidy A, Karwowski W. The emerging field of health engineering. *Theoretical Issues in Ergonomics Sciences* 2006; 7(2): 169-179.

Genaidy A, Karwowski W. Nanotechnology occupational and environmental health and safety: An emerging interdisciplinary field. *Human Factors and Ergonomics in Manufacturing* 2006; 16(3): 247-253.

Genaidy AM, Karwowski W, Ravelo E, Abdallah A, Shell R, Holley MB. Theoretical basis for general mixed object handling equations based on mechanical work required. *Theoretical Issues in Ergonomics Sciences* 2006; 7(5): 469-490.

Genaidy AM, LeMasters GK. The epidemiological appraisal instrument (EAI): A brief overview. *Theoretical Issues in Ergonomics Sciences* 2006; 7(3): 187-189.

Genaidy AM, LeMasters GK. The epidemiological appraisal instrument (EAI): A brief overview. *Theoretical Issues in Ergonomics Sciences* 2006; 7(3): 187-189.

Maudgalya T, Wallace S, Daraiseh N, Salem S. Workplace stress factors and burnout among information technology professionals: a systematic review. *Theoretical Issues in Ergonomics Sciences* 2006; 7(3): 285-298.

Moayed F, Daraiseh N, Shell R, Salem S. Workplace bullying: a systematic review of risk factors and outcomes. *Theoretical Issues in Ergonomics Sciences* 2006; 7(3): 329-344.

Paez O, Uahinui T, Genaidy A, Sun L, Karwowski W, Daraiseh N. Estimating uninsured costs of work-related accidents, Part II: An incidence-based model. *Theoretical Issues in Ergonomics Sciences* 2006; 7(3):247-260.

Salem S, Paez O, Holley M, Tuncel S, Genaidy A, Karwowski W. Performance tracking through the work compatibility model. *Human Factors and Ergonomics in Manufacturing* 2006, 16(2):133–153.

Salem O, Solomon J, Genaidy A, Luegring M. Site implementation and assessment of lean construction techniques. *Lean Construction Journal* 2005; 2(2):5-29.

Shell RL, Genaidy AM, Safety and health engineering: Research to practice, Guest Editors, *Theoretical Issues in Ergonomics* Sciences 2006; 7(3): 183-186.

Sobeih T, Daraiseh N, Genaidy A, Salem O, Shell R. Psychosocial factors and musculoskeletal disorders among construction workers: A systematic review. *Theoretical Issues in Ergonomics Sciences* 2006; 7(3): 329-344.

Sun L., Paez O, Le D, Salem S, Daraiseh N. Estimating the uninsured costs o work-related accidents, part I: a systematic review. *Theoretical Issues in Ergonomics* Sciences 2006; 7(3):227-246.

Tuncel S, Lotlikar H, Salem S, Daraiseh, N. Effectiveness of behavior based interventions to reduce accidents and injuries in workplaces: critical appraisal and meta-analysis. *Theoretical Issues in Ergonomics Sciences* 2006; 7(2):191-210.

Tuncel S, Iossifova Y, Ravelo E, Daraiseh N, Salem S. Effectiveness of controlled workplace interventions in reducing lower back disorders. *Theoretical Issues in Ergonomics Sciences* 2006; 7(2): 211-226.

Waters T, Yeung S, Genaidy A, Callaghan J, Barriera-Viruet H, Deddens J. Cumulative spinal loading exposure methods for manual material handling tasks, Part 1: Is cumulative spinal loading associated with lower back disorders? *Theoretical Issues in Ergonomics Sciences* 2006; 7(2):131-148.

Waters T, Yeung S, Genaidy A, Callaghan J, Barriera-Viruet H, Abdallah S, Kumar S. Cumulative spinal loading exposure methods for manual material handling tasks, Part 2: Methodological issues and applicability for use in epidemiological studies. *Theoretical Issues in Ergonomics Sciences* 2006; 7(2):113-130.

Waters T, Genaidy A, Deddens J, Barriera-Viruet H. Lower back disorders among forklift operators: An emerging occupational health problem? *American Journal of Industrial Medicine* 2005; 47:333-340.

OSHE student names are underlined

University of Cincinnati Publications and Presentations
Hazardous Substances Academic Training (HSAT)

Publications (Program student name is underlined; name of student supported by NIOSH HSAT funds during any portion of their training underlined and marked with asterisks).

Al-Zoughool M, Talaska G. 2005. High performance liquid chromatography method for determination of N-glucuronidation of 4-aminobiphenyl by mouse, rat and human liver microsomes. Anal Biochem. 340: 352-358.

Baccarelli A, Khmelnitskii O, Tretiakova M, Gorbanev S, Lomtev A, Klimkina I, Tchibissov V, Averkina O, Rice C, Dosemeci M. 2006. Risk of lung cancer from exposure to dusts and fibers: an autopsy-based case-control study in the Leningrad province, Russia. American Journal of Industrial Medicine. 49:460-467.

Carreón T, Butler MA, Ruder AM, Waters MA, Davis-King KE, Calvert GM, Schulte PA, Sanderson PA, Ward EM, Connally LB, Heineman EF, Mandel JS, Morton RF, Reding DJ, Rosenman KD, Talaska G. 2005. Gliomas and farm pesticide exposure in women. Environmental Health Perspectives. 13: 546-551.

Dixon SL, Wilson J, Clark CS, Galke W, Succop P, Chen M. 2005. Effectiveness of lead-hazard control interventions on dust lead loadings: Findings from the evaluation of the HUD Lead-Based Paint Hazard Control Program. Environmental Research. 98: 303-314.

Dixon S, Wilson J, Clark CS, Galke W, Succop P, Chen M. 2005. The Influence of Common Area Lead Hazards and Lead Hazard Control on Dust Lead Loading in Multi-Unit Buildings. Journal of Occupational and Environmental Hygiene. 2: 659-666.

Fischer JM, Robbins, SB, Al-Zoughool M, Kannamkumarath SS, Stringer SL, Larson JA, Caruso JA, Talaska G, Stambrook PJ, Stringer JR. 2005. Co-mutagenic activity of arsenic and benzo[a]pyrene in mouse skin. Mut Res. 558: 35-46.

Galke W, Clark S, McLaine P, Bornschein R, Wilson J, Succop P, Roda S, Breysse J, Jacobs D, Grote J, Menrath W, Dixon S, Chen M, Buncher R. 2005. National Evaluation of the US Department of Housing and Urban Development Lead-Based Paint Hazard Control Grant Program: Study Methods. Environmental Research. 98: 315-328.

Nam J, Rice C, Gail M. 2005. Comparisons of asbestos exposure assessments by next-of-kin respondents, by an occupational hygienist and by a job-exposure matrix from the National Occupational Hazards. American Journal of Industrial Medicine. 47:443-450.

Rice C, Levin L, Borton E, Lockey JE, Lilbert TJ, LeMasters GK. 2005. Exposures to refractory ceramic fibers in manufacturing and related operations: a 10-year update. Occup Environ Hyg J. 2:262-473.

Rosenman K, Hertzberg V, Rice C, Reilly MJ, Aronchick J, Parker J, Regovich J, Rossman M. 2005. Chronic beryllium disease and sensitization at a beryllium processing facility. Environmental Health Perspectives. 113:1366-1374.

Ruder AM, Waters MA, Butler MA, Carreón T, Calvert GM, Davis-King KE, Schulte PA, Sanderson WT, Ward EM, Connally LB, Heineman EF, Mandel JS, Morton RF, Reding DJ, Rosenman KD, Talaska G, Group BCCS. 2006. Gliomas and farm pesticide exposure in men. Arch Environ Health. 59: 650:657.

Talaska G, Ginsburg D, LaDow K, Puga A, Dalton T, Warshawsky D. 2006. Impact of Cyp1a2 or Ahr Gene Knockout in Mice: Implications for Biomonitoring Studies. Toxicol Letts. 162: 246-249.

Vineis P, Talaska G, Al-Zoughool M, Malaveille C, Fiorini L, Schumann B, Vietas J, Peluso M, Munnia A, Bianchini M, Allegro G, Matullo G, Sacerdote C. 2006. Randomized controlled trial: effects of diet on DNA damage in heavy smokers. Mutagenesis. In press.

CE ATTACHMENT I

Needs Assessment Tabulation – Registrations and Evaluations
7/1/2005 – 6/30/2006

1. Primary responsibility:

Industrial Hygienist	39
Occupational Safety	116
Occupational Medicine	0
Occupational Health Nursing	61
Toxicology	0
Other	58

2. I live in region:

I	19
II	6
III	40
IV	88
V	623
VI	23
VII	2
VIII	15
IX	22
X	0
Foreign	3

3. Primary employer:

Private Industry	458
State Government	44
Federal Government	76
Local Government	43
Academia	109
Other	104

ERC NEEDS ASSESSMENT SUMMARY – APHA – December 2005

1. My primary professional activity is:

Occupational Medicine -	Health Education - **3**
Occupational Health Nursing -	Environmental Safety -
Industrial Hygiene -	Public Health - **5**
Industrial Safety -	Other - **2**

2. The geographic area in which I practice my profession is:

Northeast - **4**	Southeast -	Midwest - **3**	Foreign Country - **1**
Northwest -	South -	West - **1**	

3. My primary employer is:

Private Industry -	Academic - **8**
Federal Government -	Insurance -
State Government -	Other -
Local Government -	

4. What journals and newsletters do you read or subscribe to?

AJN, AJPH, Annals of Epi, APHA-**2**, Health Communication-**2**, JAMA, Journal of Vascular Ultrasound, Nations Health, Pre-hospital Em. Care, Public Health Law

5. List the professional associations you belong to:

APHA-**3**, GSA, ICA, NAEMSE, NSEMSP, NSPHA, SVU, Urology Assoc. in Russia

6. Check those areas in which your need or interest is high.

Health Promotion in the Workplace - **3**	Respiratory Protection -
Risk Assessment - **4**	Hearing Loss/Conservation Program - **1**
Occupational Epidemiology -	Carcinogenesis - **2**
Right-to-know and Hazard Communication -	Computerized Occ. Health Info. Systems - **1**
Preventive Medicine Practice - **1**	Human Factors & Workplace Design (Ergo) -
AIDS in the Workplace - **2**	Comprehensive Industrial Hygiene Review -
Occ. Health Nursing: Basic Theory & Update -	Safety/Health for Hazardous Waste Site Personnel -
Workers' Compensation -	Toxicology - **1**
Update in Occupational Medicine -	Communications in Accident Prevention - **2**
Certification Review of Occ. Health Nurses -	Reproductive Hazards in the Workplace - **1**
Spirometry Training (Pulmonary Function Testing) -	Ventilation -
Strategic Planning, Cost Containment Strategies - **1**	Asbestos/Radon/Lead Abatement -
Health Benefit Design, Health Insurance -	Disability Evaluation -
Occupational Stress - **1**	Certification Review for Occ. Physicians -

Legal Issues in Occupational Health & Safety -
Occupational Safety - **1**
Injury Prevention - **1**
Occupational Dermatitis -
Occupational Respiratory Disease -

Certified Safety Professional Review -
Mgt. /Administration for Occ. Health Prof's -
Biosafety -
Other -

Notes:

Looking for information in Spanish
Post-doc options and information for recent graduates
Need more information on fellowship programs
Setting up training programs for researchers
Training grants
Offsite courses
OSHA
PPE
Continuing Education in industrial hygiene courses
Industrial hygiene certification
Risk communication
Agricultural safety
Prison safety
Worker safety
First responders and how to protect themselves in the event of a disaster
Day laborers
Healthy schools responsible for child safety
Directors to the schools
Atmospheric science
CME
Exiting the nursing world and entering public health
Health survey information
Health care industry
John Hopkins
Interested in being on John Hopkins mailing list
Would like to be included in the Cincinnati mailing list
Interested in being on the Southwest Center mailing list
Send information via email
Delaware State University would make a great impact

ERC NEEDS ASSESSMENT SUMMARY - AAOHN CONFERENCE: May 2006

1. My primary professional activity is:

Occupational Medicine - **2**
Occupational Health Nursing - **36**
Industrial Hygiene -
Industrial Safety -
Health Education -
Environmental Safety - **1**
Public Health -
Other - **2** (Student)

2. The geographic area in which I practice my profession is:

Northeast - **13**
Northwest -
Southeast - **3**
South - **6**
Midwest - **7**
West - **5**
Foreign Country - **3**

3. My primary employer is:

Private Industry - **18**
Federal Government - **6**
State Government - **1**
Local Government -
Academic - **2**
Insurance -
Other - **10** (Self, Hospitals)

4. What journals and newsletters do you read or subscribe to?

AAOHN-**21**, ACOEM, AIHA, AJHN, APHA, APIC-**2**, CMSA, OH Management, OHN in the Workplace

5. List the professional associations you belong to:

AANP, AAOHN-**25**, ABOHN-**3**, ACOEM, AIHA, American Assoc. of Occ. Health Nurses, AOHP-**2**, APHA, APIC-**2**, CCM, CMSA, COAOHN, COHN, CPEPR, CPR, KNA, MCNP, MGAOHN, Royal College of Nursing-UKCC, Sigma Theta Tau,

6. Check those areas in which your need or interest is high.

Health Promotion in the Workplace - **18**
Risk Assessment - **10**
Occupational Epidemiology - **13**
Right-to-know and Hazard Communication - **5**
Preventive Medicine Practice - **8**
AIDS in the Workplace - **4**
Occ. Health Nursing: Basic Theory & Update - **13**
Workers' Compensation - **8**
Update in Occupational Medicine - **10**
Certification Review of Occ. Health Nurses - **6**
Spirometry Training (Pulmonary Function Testing) - **4**
Strategic Planning, Cost Containment Strategies - **4**
Health Benefit Design, Health Insurance - **6**
Occupational Stress - **7**
Legal Issues in Occupational Health & Safety - **11**
Occupational Safety - **11**
Injury Prevention - **11**
Occupational Dermatitis - **4**
Occupational Respiratory Disease - **2**
Respiratory Protection - **9**
Hearing Loss/Conservation Program - **8**
Carcinogenesis - **5**
Computerized Occ. Health Info. Systems - **6**
Human Factors & Workplace Design (Ergo) - **3**
Comprehensive Industrial Hygiene Review - **2**
Safety/Health for Hazardous Waste Site Personnel - **2**
Toxicology - **4**
Communications in Accident Prevention - **5**
Reproductive Hazards in the Workplace - **6**
Ventilation - **2**
Asbestos/Radon/Lead Abatement - **3**
Disability Evaluation - **8**
Certification Review for Occ. Physicians - **2**
Certified Safety Professional Review - **3**
Mgt./Administration for Occ. Health Prof's - **4**
Biosafety - **5**
Ergonomics - **14**
Other - **3** (OHNP Online Program with local clinic work, Chemical/Biological Disasters)

ERC NEEDS ASSESSMENT SUMMARY - AIHCE CONFERENCE: May 15-17, 2006

1. My primary professional activity is:

Occupational Medicine - **1**
Occupational Health Nursing - **1**
Industrial Hygiene - **49**
Industrial Safety - **3**
Health Education - **1**
Environmental Safety - **2**
Public Health - **1**
Other - **3**

2. The geographic area in which I practice my profession is:

Northeast - **12**
Northwest - **2**
Southeast - **9**
South - **9**
Midwest - **17**
West - **9**
Foreign Country - **3**

3. My primary employer is:

Private Industry - **28**
Federal Government - **14**
State Government - **4**
Local Government - **1**
Academic - **6**
Insurance - **1**
Other - **7**

4. What journals and newsletters do you read or subscribe to?

ABIH-**1**, ABSE, ACGIH-**6**, ACHMM, AIHA-**17**, ASSE-**3**, BNA, Facilities Safety Newsletter, Health Physics Society Journal, IH News-**3**, Indoor Air, INSHT, JOEH-**9**, Journal of Aerosol, NIOSH, Occupational Hazards, Occupational Health & Safety, Occupational Health News, Occupational Safety-**2**, Professional Safety-**3**, Synergist-**14**,

5. List the professional associations you belong to:

ABHO, ABIH-**9**, ABSA-**2**, ACGIH-**16**, ACGMM-**3**, ACSP-**2**, AIHA-**39**, APHA-**2**, ASSE-**13**, BALSO, COA, CRBOH, LES, NEHA-**5**, NFPA, NREP, SOSE,

6. Check those areas in which your need or interest is high.

Health Promotion in the Workplace - **17**
Risk Assessment - **29**
Occupational Epidemiology - **12**
Right-to-know and Hazard Communication - **10**
Preventive Medicine Practice - **2**
AIDS in the Workplace - **3**
Occ. Health Nursing: Basic Theory & Update -
Workers' Compensation - **5**
Update in Occupational Medicine - **2**
Certification Review of Occ. Health Nurses - **1**
Spirometry Training (Pulmonary Function Testing) - **4**
Strategic Planning, Cost Containment Strategies - **2**
Health Benefit Design, Health Insurance -
Occupational Stress - **5**
Legal Issues in Occupational Health & Safety - **7**
Occupational Safety - **23**
Injury Prevention - **16**
Occupational Dermatitis - **7**
Occupational Respiratory Disease - **19**
Respiratory Protection - **27**
Hearing Loss/Conservation Program - **24**
Carcinogenesis - **14**
Computerized Occ. Health Info. Systems - **8**
Human Factors & Workplace Design (Ergo) - **11**
Comprehensive Industrial Hygiene Review - **10**
Safety/Health for Hazardous Waste Site Personnel - **10**
Toxicology - **15**
Communications in Accident Prevention - **7**
Reproductive Hazards in the Workplace - **12**
Ventilation - **21**
Asbestos/Radon/Lead Abatement - **8**
Disability Evaluation - **2**
Certification Review for Occ. Physicians - **1**
Certified Safety Professional Review - **13**
Mgt./Administration for Occ. Health Prof's - **4**
Biosafety - **13**
Ergonomics - **14**
Other - **8** (Nanotechnology, Pandemic Flu, Heat Stress, Noise, Mercury, Safety Management, Dermal Exposure, Bio Pharmaceutical Toxicology)

PRP ATTACHMENT I

Research Project Grants Funded and Submitted Based on Results from Pilot Grants July 1, 2005 – June 30, 2006

Name	Grant
Dianne M. Felblinger, EdD, MSN, WHNP-C, CNS University of Cincinnati	Felblinger, D. M. & Gates, D. Shame Levels in Domestic Violence Screening and Treatment in the Workplace. Under review for Dean's Research Challenge Award, College of Nursing, University of Cincinnati. December 2005. Felblinger, D. M. & Gates, D. Shame Levels in Domestic Violence Screening and Treatment. Rabinowitz Award, College of Nursing, University of Cincinnati. Funded January 4, 2005: $1,000. Moss, N. (Principal Author), & Felblinger, D.M. (Co-Director). Nurse Midwifery/ Women's Health Initiative Advanced Education Nursing Program Grant. Submitted to U.S. Department of Health and Human Services, DO9 HP3559, Health Resources and Services Administration (HRSA). Submitted November 2003. Funded, July 1, 2004: $635,992 for 2004-2007.
Jay Kim, PhD University of Cincinnati	Kim, Jay. Development of Risk Assessment of Complex Noise. NIOSH. R21 Grant Funded April 2006: $338,650 for 2006-2008

Funding Period: 08/01/2005-06/30/2006

University of Cincinnati
2005-06 PRP Awards

Principal Investigator	University	Title of Project
Scott Hutton	UC	Workplace Incivility Among Nursing Staff and Losses in Productivity
Yulia Iossifova	UC	Comparison of Two Methods for Measurement of Fungal (1-3) -p-d-glucan
Chunhui He	UC	Physical and Psychosocial Demands on Day and Night Shift in Nursing Homes
Devender P. Singh	UC	Evaluating the NIOSH Lifting Equation for Obese Workers
Jennifer Yugo	BGSU	Predicting Youth Farm Injury: A Psychological Perspective
Woojin Park, Ph.D.	UC	Obesity Effects of Postural Stability During Standing
Sheryl Milz, Ph.D.	MCO	Evaluating Vapor Intrusion from Gasoline Underground Storage Tanks
Susan Kotowski	UC	The Ergonomics of Electronic Medical Records
Janet Wray, Ph.D.	UC	Personal Safety, Violence and Hospital-Based Psychiatric Nurses and Workers
Farhang Akbar-Hhanzadeh,	MCO	HEPA Filter Efficiency Testing During Filter Installation
Jennifer Gillespie, Ph.D.	BGSU	Health and Safety Training for Direct Care Providers of People with Dementia
Christopher Rhea	Purdue	Do Optical Properties of Obstacles Affect the Risk of Tripping in Construction Workers?
Taekhee Lee	UC	Relationship Between Indoor and Outdoor(1-3)B-D-Glucan, Fungal Spore and Pollen
Kari Dunning, PhD	UC	The Impact of Injury Status on Pain Response During Physical and Mental Stress
Setenay Tuncel	UC	Effectiveness of Work Compatability in Evaluating and Improving Worker Health
Jie Chen	UC	Trunk Postural Load in Nurses - Can It Be Measured?
Gerald Kasting, Ph.D.	UC	The Effects of Jet Fuel (JP-8) on Dermal Absorption of Used Engine Oil
		Total Awarded: $93,043

UC=University of Cincinnati
MCO=Medical College of Ohio
BGSU=Bowling Green State University

GRANT WRITING WORKSHOP

Sponsored by:
Pilot Research Project (PRP) Program
of the NIOSH Education and Research Center
at the University of Cincinnati
Department of Environmental Health

Marriott Kingsgate Conference Center
Mt. Lookout - Room 136

April 3-4, 2006

AGENDA

Presenter: ***Dr. John Kues***

DAY 1

TIME	**TOPIC**
7:30 – 8:00	Registration/Continental Breakfast - Room 136
8:00 – 8:15	Welcome/Introductions
8:15 – 8:30	Workshop Overview
8:30 – 9:45	Session 1: Introduction to Grant Writing
9:45 – 10:00	***Break***
10:00 – 11:00	Session 2: Funding Sources and the Federal Grant Lexicon (Grants.gov)
11:00 – 12:00	Session 3: Overview of US Government Grant Applications: PHS 398 and SF424 (R&R)
Noon – 1:00	***Networking Lunch in the Marriott's Caminetto Restaurant***
1:00 – 2:45	Session 4: US Government Grant Applications: PHS 398 and SF424 (R&R) forms and submission
2:45 – 3:00	***Break***
3:00 – 4:45	Session 5: Constructing a Good Grant Proposal

GRANT WRITING WORKSHOP

Sponsored by:
Pilot Research Project (PRP) Program
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Department of Environmental Health

Marriott Kingsgate Conference Center
Mt. Lookout - Room 136

April 3-4, 2006

DAY 2

Moderators: **Dr. Amit Bhattacharya, Program Director**
Amber J. Twitty, ERC Program Coordinator

TIME	TOPIC	SPEAKER(S)
7:30 – 8:00	Continental Breakfast	
8:00 – 8:45	Overview of NIOSH Extramural Programs Working with Program Officers NORA 2	Dr. Linda Frederick
8:00 – 9:00	Q&A	
9:00 – 9:45	Research to Practice Initiative (R2P)	Dr. DeLon Hull
9:45 – 10:00	Q&A	
10:00 – 10:15	***Break***	
10:15 – 11:00	Training Grants The Grant Review Process	Mr. John Talty Dr. Bernice Kuchinski
11:00 – 11:15	Q&A	
11:15 – 11:45	Study Sections	Dr. C. Scott Clark Dr. Carol Rice
11:45 – 12:00	Q&A	
Noon – 1:00	***Networking Lunch in the Marriott's Caminetto Restaurant***	
1:00 – 2:00	Research Career Paths/Experiences	Dr. C. Scott Clark Dr. Sergey Grinshpun Dr. Carol Rice
2:00 – 2:15	Q&A	
2:15 – 2:45	NIH Roadmap	Dr. Joel Tsevat
2:45 – 3:00	Q&A	

University of Cincinnati Education and Research Center (ERC)
Supported by the National Institute for Occupational Safety and Health (NIOSH)

Sixth Annual

Pilot Research Project Symposium

October 20 & 21, 2005

Abstract Booklet

Presentations by

2004 and 2005 Awardees

Kehoe Auditorium

Kettering Laboratory

University of Cincinnati

Thursday 10/20/05 1:00 p.m. — 5:30 p.m.

5:30 p.m. – Picnic Sponsored by the Academy of Kettering Fellows

Friday 10/21/05 8:30 a.m. — 12:30 p.m.

0.5 ABIH (IH) CM Points Per Day

UNIVERSITY OF Cincinnati

Department of Environmental Health
University of Cincinnati
222 Kettering Laboratory
PO Box 670056
Cincinnati, OH 45267-0056
Phone 513-558-5710 FAX 513-558-2722

Abstract Booklet

Pilot Research Program Overview

The University of Cincinnati's Education and Research Center (ERC) which is housed within the Environmental and Industrial Hygiene Division of the Department of Environmental Health, has been sponsored by the National Institute of Occupational Safety and Health (NIOSH) for the past 27 years. The Pilot Research Program (PRP) was instituted 6 years ago under the auspices of the ERC's graduate training program. The overall goal of PRP is to train and provide competitive research grant funds to graduate students, doctoral students and junior faculty members. Under the auspices of PRP, there are 9 other institutions in the region that participate with the University of Cincinnati. They are Central State University, Bowling Green State University, Eastern Kentucky University, Medical University of Ohio, University of Kentucky, Purdue University, Kentucky State University, Murray State University and Western Kentucky University. Each year the PRP Symposium is held as a means to showcase the research funded by the program and to make available the opportunity for students, researchers and professionals in the industry to network. Dr. C. Scott Clark serves as the director for both the Environmental and Industrial Hygiene Division and the ERC . Dr. Amit Bhattacharya, serves as the director of the PRP training program.

Recent accomplishments

The Pilot Research training Program (PRP) five year grant application was competitively reviewed by NIOSH in March 2005 and it received an outstanding review and has been funded through 2010. During the first five years of its operation, the PRP program has funded eighty-three projects from a total of 94 proposals from the participating institutions. Collectively, the PRP awardees have already produced a total of 41 peer-reviewed articles and conference presentations directly resulting from their PRP pilot research grant activities. During the last 5 year period, PRP awarded a total of $ 382,289 to eighty three awardees and the data collected (and the experience gained by the awardees) in the pilot grants resulted in grant awards totaling about $2,894,386 million from various sources other than PRP such as NIOSH, USDA, CDC, etc. This reflects a return on the investment equaling 8:1. Furthermore, PRP also allowed bringing in 15 new investigators from other fields of expertise to the area of occupational safety and health research.

For more information about the Pilot Research Program please contact Dr. Amit Bhattacharya, PRP Director, at (513) 558-0503 or Amit.Bhattacharya@uc.edu.

University of Cincinnati Education and Research Center (ERC)
Supported by the National Institute for Occupational Safety and Health (NIOSH)

Keynote Speaker for Thursday, October 20, 2005

Jean Grassman, PhD
Associate Professor and Deputy Chair-Health
Health and Nutrition Sciences
Brooklyn College-CUNY
e-mail: grassman@brooklyn.cuny.edu

Jean Grassman is an Associate Professor in the Department of Health and Nutrition Sciences at Brooklyn College in Brooklyn, New York. She currently teaches occupational and environmental health to both graduate and undergraduate students. Grassman directs the MPH Program and is the deputy chair of the school's graduate program in health. She previously worked with the Molecular Epidemiology Program at NIEHS and the Environmental Science Program at Columbia University. In 1994, Grassman was selected as an AAAS Science and Engineering Fellow where she served at the EPA in Washington, DC.

Grassman attended the University of California-Berkeley School of Public Health where she studied environmental health sciences, specializing in industrial hygiene. She received her Master's degree in 1989 and her doctorate in 1992. As an undergraduate, she attended the University of Wisconsin where she received degrees in Anthropology and Zoology in 1982. She has been a member of the American Industrial Hygiene since 1986 and has served as Chair of both the Social Concerns and the Biological Monitoring Committees.

Grassman chairs the Brooklyn College chapter of her union's health and safety committee and is active in CUNY-wide health and safety activities.

Her research program investigates the effect of dioxins in human populations. Her current activities include investigating the impact of PBDE's on human cells and an ongoing study of the impact of dioxin exposure in Russian firefighters.

She is married and lives in Brooklyn. When she has time, she enjoys running, bird-watching and studying dance.

Page 4

Abstract Booklet

Keynote Speaker for Friday, October 21, 2005

Linda McCauley, PhD, FAAN, RN
Nightingale Professor of Nursing, and Associate Dean for Nursing Research
University of Pennsylvania School of Nursing
email: lmccaule@nursing.upenn.edu

Dr. McCauley's current research includes a community-based intervention and research project targeted at reducing pesticide exposures among minority farm workers. This work aims to identify culturally-appropriate interventions to decrease the pesticide exposures of farm workers and their children. The epidemiological approach used in these investigations incorporates survey questionnaires on exposure, biomarkers of exposure to organophosphate pesticides and assessment of neurobehavioral function. A major goal of this research project is to disseminate the findings in ways that are understandable and meaningful to migrant and seasonal farm workers. She also integrates molecular epidemiology into her research studies. She is currently investigating developmental vulnerability among adolescent farm workers who are exposed to pesticides, incorporating state-of-the-art measures of biomarkers of oxidative stress and DNA damage in her study protocols. Using an interdisciplinary community-based research design she has studied extensively cultural differences in perceptions of work safety and worker protection. Culturally appropriate translation of research findings to the affected communities is an integral part of her research program. In her investigations of environmental exposures and health effects, Dr. McCauley has become increasing aware of the role that genetic susceptibility plays in the risk of acquiring disease. Because of the rapidly advancing discoveries in genetic science and her interest in immigrant populations, Dr. McCauley has recently begun a new project that aims to bring together genetic scientists and communities, particularly disinfranchised populations to increase our understanding of the ethical, legal, and social implications of research on genetic susceptibility and environmental exposures.

Thursday, October 20, 2005
Platform Presentation Schedule

Time	Page#	PI Name	(University)(Award Year)	Title
1:10 – 1:40		**Keynote Lecturer Dr. Jean Grassman, PhD**		
		"A Different Kind of Biomarker: Changes in Gene Expression After Exposure to Dioxins"		
1:45 – 2:05	7	Mingming Lu, PhD	(UC)(1)	Composition identification of Odorous in Anima
2:05 – 2:25	7	Setenay Tuncel Richard Shell, PhD & Judy Jarrell, Phd	(UC)(1)	Customized Integrated Intervention for Injury Prevention
2:25 – 2:45	8	Anthony Arment, PhD	(CSU)(1)	Use of E-Beam Technology to Produce Silver-Fabric Bactericidal Composites
2:45 – 3:45		**Refreshments & Poster Session (Kettering Lobby)**		
		Platform Presentations		
3:45 – 4:05	9	Mustafa Al-Zoughool & Glenn Talaska, PhD	(UC)(1)	Glucuronidation in Arylamine-Induced Breast Genotoxicity
4:05 – 4:25	10	Ashley Guidroz, Jennifer Burnfield, Olga Clark & Heather Schwetschenau	(BGSU)(1)	An investigation of the Impact of Incivility Among Nurses
4:25 - 4:45	10	Mark Knezovich, Fan Xu James McGlothlin, PhD	(PU)(1)	Evaluation of Ergonomic Controls for the Preparation of Footers in Post-Frame Building Construction
4:45 - 5:05	11	Jay Vietas Glenn Talaska, PhD	(UC)(1)	In-Vivo Effects of Arsenic Speciation on BaP

Friday, October 21, 2005
Platform Presentation Schedule

8:30—8:35 **Opening Remarks**

8:40—9:15 **Keynote Lecturer: Dr. Linda McCauley, Phd, FAAN, RN**
"Closing the Research Link: Farmworker Pesticide Exposure, Biomarkers and Neurobehavioral Effect"

9:15 – 9:35	11	Olga Clark Steve Jex, PhD	(BGSU)(1)	Predicting Compliance with Universal Precautions
9:35 – 9:55	12	Dianne M. Felblinger, EdD, MSn, WHNP-C, CNS & Donna M. Gates, EdD, MSPH, MSN	(UC)(1)	Domestic Violence Screening and Treatment in the Workplace
9:55 – 10:15	13	Woojin Park, PhD	(UC)(1)	Obesity Effects on Lifting/Lowering Movement Pattern

UC = University of Cincinnati
CSU=Central State University
PU = Purdue University
MUO=Medical University of Ohio
BGSU = Bowling Green State University
(1) = Funding Period 8/15/04 — 6/30/05
(2) = Funding Period 8/01/05 — 6/30/06

Abstract Booklet

Time	Page#	PI Name	(University)(Award Year)	Title
10:15 – 11:15		**Refreshments (Lobby) & Poster Session (Kettering Atrium)**		
		Platform Presentations		
11:15 – 11:35	14	Chunhui He, Kermit Davis, PhD	(UC)(1)	Body Type Impact on Whole Body Kinematics During Manual Handling
11:35 – 11:55	15	L. Jean Whingther, Christopher J. Cunningham & Steve Jex, PhD	(BGSU)(1)	Understanding the Work-Family Consequences of Shiftwork

Poster Presentations (Both Days)

Poster No.	Page#	Name	University	Title
1	15	Jennifer Gillespie	BGSU	Health and Safety Training for Direct Care of People with Dementia
2	16	Woojin Park, PhD	UC	Obesity Effects of Postural Stability During Standing
3	16	Scott Hutton Donna Gates, EdD	UC	Workplace Incivility Among Nursing Staff and Losses in Productivity
4	17	Janet Wray, PhD	UC	Personal Safety, Violence and Hospital-Based Psychiatric Nurses and Workers
5	18	Susan Kotowski Kermit Davis, PhD	UC	The Ergonomics of Electronic Medical Records
6	18	Jennifer Yugo	BGSU	Predicting Youth Farm Injury: A Psychosocial Perspective
7	19	Devender Singh Woojin Park, PhD	UC	Evaluating the NIOSH Lifting Equation for Obese Workers
8	20	Yulia Iossifova	UC	Comparison of Two Methods for Measurement of Fungal (1-3) - p-d-glucan
9	20	Chunhui He Kermit Davis, PhD	UC	Physical and Psychosocial Demands on Day and Night Shift in Nursing Homes
10	21	Sheryl Milz, PhD	MUO	Evaluating Vapor Intrusion from Gasoline Underground Storage Tanks

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Platform Presentations

Composition Identification of Odorous Compounds in Anima

Mingming Lu, PhD
University of Cincinnati

The odorous emissions from confined animal feeding operations (CAFO), such as wine, poultry and dairy farms, are the main cause of community complaints, but are not well characterized due to the absence of legislations and the limitations in sampling and instrumentation techniques. This proposal is aimed at the innovative use of high volume sampling with sorbent cartridges to collect the odorous emissions from CAFO farms at representative locations.

The sorbent was custom designed to take into consideration of the potential compounds that can exist in a dairy farm. It has also been tested with the artificial odor from the swine manure for feasibility. The individual compositions of the odor have been identified using GC-MS and HPLC. The carbon fraction has been analyzed for the particulate matter collected at select locations. The preliminary data on the organize odor compositions has been obtained, and indicated that the sampling and analysis can be greatly improved with lower costs. This will be helpful to better health risk assessment, and the development of more effective control technologies.

Customized Integrated Intervention For Injury Prevention

Setenay Tuncel
University of Cincinnati

Lower back disorders (LBDs) are the number one cause of disability in workers under the age of 45 (National Institute of Neurological Disorders and Stroke, 2004), causing Americans to spend at least $24 billion each year on direct medical costs (Lahad et al. 1994). Due to the severe impact of LBDs on the life of individuals and the economy of the country, extensive research has focused on the etiology, prevention and treatment of the lower back. Winkel and Mathiassen (1994) categorized possible risk factors under three groups: individual, biomechanical, and psychosocial. Cumulative or combined effects (Johanning, 2000) of these risk factors led to increased complexity of the solution to the problem, pointing out a need for designing intervention that address different risk factors of LBDs simultaneously. Selecting the correct set of risk factions to be addressed in an intervention is critical for success of the intervention. Thus a detailed workplace assessment which addresses both physical and non-physical work environments to identify the risk factors for a specific workplace is critical. Even though, at some point, expert knowledge and management participation is required to pinpoint precautious for the reduction of the LBD's prevalence in a specific workplace, an automated process could greatly reduce necessary time and effort.

Based on need of workplace assessment, Robertson and Courtney (2004) adapted the systems analysis model originally proposed by Mosard (1982) to solve health and performance problems. Even though they integrated both microergonomic and macroergonomic aspects of the work environment as a list of potential problematic areas in health problems, and used this list for improvement, their workplace assessment is limited to office systems. Another popular approach is adapting proven business approaches into the area of safety and health. For example, based on the connection between ergonomics problems and quality deficiencies (Eklund 1999), Rahimi (1995) integrated safety and health planning into a Total Quality Management system. Similarly Ketola and coworkers (2002) applied Malcolm Baldrige Criteria for Performance Excellence to assess and improve occupation safety and health management. However, these efforts are far from providing a read-to-use tool for the assessment of work environments. Although Ramsauer (2001) provided a survey as a ready-to-use assessment tool to

identify issues in the workplace, because the process is not automated, the decision-making process to prioritize improvement areas requires extensive expert knowledge. On the other hand, Cagno et al. (2001) developed an algorithm to prioritize safety improvement areas based on risk assessment and business constraints. Even though the algorithm includes automation, it does not offer an assessment tool. Mattila (1987) provides a survey as an assessment tool and an algorithm for prioritization; however the number of risk factors is quite limited to assess both physical and non-physical environments in detail. Genaidy and Karwowski (2003) proposed the *Work Compatibility* concept: the work environment may replenish a worker's energy as an *energizer*, or it may deplete the worker's energy as a *demand*. Work Compatability Level (WCL) is defined as the degree of balance between energizers and demands. Low WCL indicates the imbalance between energizers and demands, i.e., a poor work environments, which may lead to adverse health effects. Their ready-to-use assessment tool enables works to evaluate an extensive number of physical and non-physical work environment variables. Effective use of computer programming is required to reduce the time and effort spent by experts and management to design intervention.

Use of E-Beam Technology to Produce Bactericidal Silver-Fabric Composites

Anthony Arment, PhD

Central State University

Silver has a long, historical use as a bactericidal metal; as early as 550BC, according to the writings of Herodotus (silverinstitute.org), silver was used for beverage storage during long voyages. Silver nitrate has been used medically in podiatry to treat neonatal conjunctivitis; legislation from 1909-1959 required this treatment in newborns, resulting in a decrease in infant blindness from 24% to 0.3% as measured by admissions to schools for the blind (Tortora et al., 2004). Other silver salts have been used as disinfectants and in the treatment of various infections such as moniliasis (candidiasis) and trichomoniasis. Silver Sulfadiazine is used as an antibiotic and antifungal topical, particularly in burn cases where nosocomial infections (*Staphylococcus* and *Pseudomonas*) are a high-risk.

Silver exerts its antimicrobial effects oligodynamically that is to say from the action of relatively few molecules. It functions as many of the other heavy metals do against microbes, effecting membrane stability, inhibiting DNA replication, and interacting with thiol groups in proteins to denature them (Matsumura et al., 2003). However, the use of colloidal silver as a treatment is hotly debated between traditional and alternative medicine (van Hessalt et al., 2004; silvermedicine.org).

Silver is being tested in various industrial applications as a coating compound to retard or prevent bacterial growth and biofilm formation (Cowan et al., 2003). The application of silver salts to fabric to control the presence of odor-causing bacteria in socks and sports clothing has become commonplace. Silver-impregnated nylon (X-static) has been tested for its ability to retard and prevent bacterial growth among a large number of bacterial genera (MacKeen et al., 1987). Nylon fibers were incubated in bacterial cultures then evaluated for CFU reduction potential; these fibers were active because of the slow release of silver salts from fabric.

With the advent of e-beam technology, it is possible to go from beyond impregnating metal slats into fabrics for slow release to bonding the two substances into a composite. Central State University (CSU) maintains collaborative research ties with Kent State University (KSU). KSU maintains a 150 kW, 5 MeV electron accelerator in partnership with Mercury Plastics, Inc. (MPI) as part of their joint Program on Electron Beam Technology

(PEBT); the joint facility is the NEO Beam Alliance Ltd.. Faculty at PEBT has expressed interest in developing collaborative research projects with CSU. This proposal marks the first project geared towards this collaboration. This project impacts the NORA Research Agenda in two important areas: Emerging Technologies (e-beams) and Control Technology and Personal Protective Equipment.

The primary goal of the project is to evaluate the usefulness of e-beam technology in creating bacteriostatic lab coats using silver as a means of bacterial control. Within this goal lie the following specific aims to:

1. Test different e-beam treated synthetic fabrics used in lab coats for effectiveness in retarding bacterial growth.
2. Distinguish differences in resistance between different bacterial genera.
3. Test the longevity of treated fabrics to withstand repeated exposure as measured by repeated washing.
4. Optimize e-beam treatment and silver concentrations for maximum effectiveness.

Glucuronidation in Arylamine-Induced Breast Genotoxicity

Al-Zoughool Mustafa Hussein
Glenn Talaska, PhD
University of Cincinnati

The breast is the most important incident site for cancer in women and the second leading cause of their cancer deaths. Only 50% of cases can be understood in terms of know risk factors. Environmental causes are assumed to contribute significantly to the remainder, but their impact is unknown. Tobacco smoking has been shown to contribute to breast cancer, but the elevated risk associated with smoking in all women appears modes. Aromatic amines are major carcinogenic components in tobacco smoke and are also the best characterized occupation carcinogens. If only a sub-group of women smokers are at elevated risk due to the way the metabolize aromatic amine procarcinogens in tobacco smoke, their risk my be diluted toward the background when all women smokers are considered. Women are known to be slow glucuronidators when compared to men and a wide distribution in the rates of glucuronidation of women has been seen using substrates such as cotinine.

The focus of this research is to conduct the first investigation of the role of procarcinogen glucuronidation phenotype may play in human breast carcinogenesis. Our hypothesis is that the ability of breast tissue samples to glucuronidate a specific aromatic

An Investigation of the Impact of Incivility Among Nurses

Ashley Guidroz, Jennifer L. Brunfield, Olga L. Clark and Heather M. Schwetschenau
Bowling Green State University

This study was a pilot study of a measure of incivility. A general measure of incivility was tailored for the healthcare setting in order to identify that nurses may experience at work. Focus groups were conducted to learn more about the experience of incivility at a hospital and to gather information about what behaviors would be considered uncivil or rude. These results helped to create a tailored measure title the Nursing Incivility Scale. This scale measures incivility experienced in the general work environment as well as from nurses, supervisiors, physicians and patients. Followng the focus groups, surveys were mailed to nurses working at a large hostipal in the Mid-West. Results indicated good rliability and validity. However, there was not enough statistical

power to conduct item-level analysis to verify the factor structure of the scale. Future efforts will be directed at collecting more data to run these analyses.

A Pilot Field Study Involving the Evaluation of Ergonomic Controls for the Preparation of Footers in Post-frame Building Construction

Mark Knezovich, Fan Xu, James McGlothlin, PhD

Purdue University

A footer preparation process of a post-fram building construction crew was examined as part of an ergonomic intervention study involving an alternative tool and a newly developed tool (N=5 pre– and 4 post-intervention sites). Data from the pre-intervention process was compared to data from the post-intervention process in order to determine the effect on physical work demand. Measured tasks of interest in the pre-intervention phase of the study included the use of a standard post-hole tool for removing excess soil from pre-drilled holes, the manually lifting and drompoping of concrete footer pads weigh in between 44 and 66 lbs., and the shoveling of unearthed soil both away from and back into the footer holes. The measured tasks for the introduction of an phase of the study were the same as the pre-intervention tasks except for the introduction of an altered commercially available alternative post-hole digging tool and a concrete footer pad lift and drop device designed for this study. In the absence of an ergonomic control, the shoveling tasks were examined for instances of irregular patterns of recovery in heart rate between each hole. Measurement methods for various parameters of crew-member work exposure included: time synchronized heart rate monitoring with Polar Vantage NV™ heart rate monitoring system used with a standard video camera, ratings of perceived exertion (RPE) using the aBorg RPE scale, biomechanical analysis using the University of Michigan's 3D Static Strength Prediction Program™ v.5.0.0., and time cycle analysis from video review. ANCOVA (SAS® v.9.1) was used to determine the effect of the independent intervention variables.

The introduction of the two intervention appeared to have no significant effect on measurements of both heart rate and ratings of perceived exertion for the single subject performing the work (p-values>0.05). The introduction of the alternative post-hole digging tool appeared to have no significant effect on the post-hole cycle (p-value>0.05). The introduction of these concrete footer pad lift and drop device had a significant negative effect on the task cylce times (p-value<0.05). However, both intervention showed decreasing trends in cycle times over the post-intervention study sites, implying that a possible learning effect may have been occurring. Likewise, a decreasing trend was also noticed in the mean per-

ceived exertion scores for the use of the concrete footer pad lift and drop device, which may be due to a general trend in improving ground conditions or also to the possible occurrence of a learning effect. An estimation of the range of compressive force in the L$/L% vertbral region resulting from the manual lifting of force in the same area of the back when lifting pads with the intervention mechanism is between 158 and 172 lbs. Future research should focus on the introduction of the concrete footer lift and drop device to a larger number of subjects and work sites in order to further investigate the trend of decreasing cycle times and rating of perceived exertion. Further research should also attempt to better validate the mechanism as a viable alternative to manual lifting of concrete pads.

Co-Exposure Of Arsenite And Benzo(a)pyrene: Effect Of Glutathione On DNA Adduct Levels

J. Vietas, G. Talaska, PhD
University of Cincinnati

Humans are considered the most sensitive species to arsenic exposure with increased risk to skin, lung and bladder cancer. Epidemiologic studies of workers simultaneously exposed to benzo[a]pyrene (BaP) and arsenite (As) report additive to multiplicative effects. These studies are supported by both in vitro and in animal studies demonstrating an increase in BaP DNA adduct levels when co-treated with BaP and arsenite than when treated with BaP alone. Glutathione, the major thiol compound responsible for maintaining redox homeostasis, may provide cellular protection against arsenite's ability to increase the likelihood of DNA damage. We characterized the effect of modulating glutathione levels, through the use of buthionine sulfoximine (BSO) and glutathione ethyl ester (GSHEE) treatment as well as by using glutathione deficient knockout mice, on the formation of DNA adduct levels after co-exposure to arsenite and benzo(a)pyrene. Lung and skin tissues were analyzed for DNA adducts using ^{32}P-postlabeling. Arsenic cotreatment increased average BaP adduct levels in both lung and skin; the increase was statistically significant in the lung ($p=0.048$). A reduction in glutathione level increased BaP adduct levels, although only significantly in the skin of mice treated with BSO ($p=0.028$). Treatment with GSHEE reduced adduct levels, although not significantly ($p > 0.05$) in any tissue measured. These results are consistent with previous in vitro and in vivo findings and suggest that glutathione plays a minor role in arsenic's ability to potentiate BaP DNA adduct formation.

Predicting Compliance With Universal Precautions

Olga Clark, Steve Jex, PhD
Bowling Green State University

This research is directly related to occupational safety and health. Specifically, it is aimed at reducing occupational injury and illness associated with exposure to bloodborne infections. Accidental exposure to blood-borne pathogens is a serious occupational hazard for thousands of health care workers. It inflicts a tremendous toll in terms of human and economic costs. The population at risk includes thousands of health care workers who have contact with patients and patient specimens in hospital and laboratory settings. Universal precautions are safe work practice guidelines that were developed by the Centers for the Disease Control and Prevention. Universal Precautions

(UP) are effective at preventing accidental exposure. However, according to surveillance evidence, the level of compliance with universal precautions among health care workers is often low. The investigators integrated two distinct areas of research: occupational safety and industrial/organizational psychology, to identify organizational and individual factors that influence compliance with universal precautions. The aim of this study was to explore the psychological processes involved in adhering to safer work practices. The results of this study may tell us under what conditions health care workers are less likely to follow universal precautions and what could be done to increase compliance. The results of this exploratory study may also inform future research efforts and help improve work practices by guiding the development of a training program.

Domestic Violence Screening and Treatment in the Workplace

Dianne M. Felblinger, EdD, MSN, WHNP-C, CNS & Donna M. Gates, EdD, MSPH, MSN

University of Cincinnati

The purpose of this study was to survey members of the American Association of Occupational Health Nurses (AAOHN) regarding their beliefs about their ability to screen for and treat domestic violence (also called intimate partner violence) in the workplace. The specific research aims were: (1) Identify the educational training that Occupational Health Nurses receive about workplace screening for and treatment of domestic violence. (2) Describe the Occupational Health Nurses' beliefs about their ability to complete workplace screening for and treatment of domestic violence. (3) Identify the relationship between the educational training, demographics and work experiences of Occupational Health Nurses and their perceived ability to complete workplace screening and treatment of employees who experience domestic violence. A total of 458 AAOHN direct care providers or case managers throughout the United States anonymously completed the mailed instrument "Occupational Health Nurses' Survey on Screening for Domestic Violence in the Workplace." Results of the study showed that although Occupational Health Nurses consider domestic violence screening and treatment to be components of their nursing role, they do not believe that they have had adequate training to competently and comfortably complete the screening and treatment aspects of domestic violence care. The Occupational Health Nurses also did not perceive that there were existing policies in their workplace to assist them in dealing with domestic violence cases. This study provided baseline information about screening and treatment for domestic violence by Occupational Health Nurses in the workplace and addressed a priority of both the NORA and AAOHN research agendas. Information from the study can be used to serve as the foundation for future policy development and intervention research that benefits multiple stakeholders, including employees, employers, nurses and academicians.

Obesity Effects on Lifting/Lowering Movement Pattern

Woojin Park, PhD

University of Cincinnati

Obese workers represent a significant portion of the workforce in today's industry. A recent statistics by Flegal et al. (2002) reported that nearly one third (30.5%) of U.S. adults are obese and predicted that obesity will continue to increase rapidly in the United States. Obesity may be a risk factor for work-related musculoskeletal disorders (WMSDs) from manual materials handling (MMH), as heavier body mass may subject obese workers to higher biomechanical stresses than non-obese workers.

Body mass affects biomechanical stresses during MMH. Also, motion pattern (joint angle-time trajectories)

adopted by a worker also affects them (Hsiang et al., 1997; van Dieën et al., 1999). When performing a MMH task, obese workers may move differently than non-obese workers to compensate for heavier body mass and reduce biomechanical stresses in certain body areas. In other words, obese workers may adopt more self-protective motion strategies than non-obese workers. Recently, DeVita and Hortobagyi (2003) and Sibella et al. (2003) identified self-protective motion strategies associated with obesity for walking and sit-to-stand movement, respectively.

Despite the prevalence of obesity and its potential importance as a risk factor for WMSDs, movement patterns of obese individuals during MMH have not been extensively studied. At present, it is largely unknown whether or not there exist significant differences between motion patterns of obese and non-obese individuals during MMH and how such potential differences would affect biomechanical stresses.

Testing differences between motion patterns of obese and non-obese individuals during MMH has practical importance. If it is found that motion patterns of obese workers are not significantly different from those of non-obese workers, then obesity can be established as a risk factor for WMSDs that increases biomechanical stresses by excess body mass. Practical implications of such finding would be as follows: 1) it may be necessary to slightly modify existing ergonomic design guidelines (e.g., NIOSH lifting index) to adequately protect the obese worker population, 2) existing posture/motion simulation models (Faraway, 1997; Park et al., 2004) and kinematic motion databases (Chaffin, 2001) mainly based on data from non-obese individuals can be used for computerized ergonomic design for the obese worker population, without any modifications or additional data collection, and 3) self-protective movement techniques may be developed in the future studies to reduce biomechanical stresses for the obese worker population. If obese workers are found to indeed adopt more self-protective motion strategies than non-obese workers, then the obesity effects cannot be regarded as simple increase in body mass. Implications of such finding would be as follows: 1) comprehensive empirical studies will be needed to accurately define hazardous and non-hazardous working conditions for the obese worker population and further develop new MMH task design guidelines for obese workers, 2) special posture/motion simulation models will need to be developed for computerized ergonomic design for the obese worker population, and 3) self-protective movement strategies of obese workers may be further studied to elicit their biomechanical principles and utilized as safer movement techniques for the general worker population such that even non-obese workers can benefit by adopting them.

To gain a better understanding of biomechanical effects of obesity and further provide a basis for establishing future research directions, the objective of the proposed research was to test differences between non-obese and obese individuals in their motion patterns during whole-body lifting and lowering and identify how such differences affect biomechanical stresses in body areas. Lifting and lowering were selected because they are common in many industries and also known as primary risk factors for low back injuries.

Low Back Biomechanics & Workplace Stress Laboratory

Chunhui He, MS, Kermit Davis, PhD
University of Cincinnati

Obesity is one of several factors that have been associated with the development of low back pain (LBP). One potential mechanism for such an association is differences in mechanical disadvantage with respect to weight

distribution, in that, how the weight is distributed may physically alter the way an obese individual moves. The distribution of body weight in obese individuals falls into three body types: apple-shaped, pear-shaped, and tube-shaped with the two later being most common. The objective of this study was to investigate the whole-body kinematics of individuals in the two most prevalent body type groups (pear and tube) while performing manual material handling tasks. The participants performed symmetric and asymmetric lifting of boxes (weighing 4.5 and 9.1 kg, with and without handles) from mid-shin and knee to elbow height. The angular angles, velocities, and accelerations of the major joints: ankle, knee, hip, shoulder, and elbow were attained using the Peak Motus motion capturing system. The pear-shaped individuals lifted with greater angles and faster motion in the hips (about 6^{o} in posture and 15^{o}/s in velocity) but with slower motions for the ankles and elbows (between 15 and 30^{o}/s in velocity) in comparison to tube-shaped individuals. The difference in kinematic responses was magnified at the lower origin height and when lifting without handles. Similar results were found for lowering tasks. The study provided a preliminary evaluation of whether weight distribution impacts how an individual lifts. From the results, it is apparent that biomechanical alterations occur that may place certain obese individuals at more risk of LBP. The results allude to a potential increase in risk of LBP development for pear-shaped obese individuals and may need to be compensated through engineering controls. Future research will need to determine the biomechanical loading that results from these kinematic differences to truly understand the impact of weight distribution.

Understanding the Work-Family Consequences of Shiftwork

L. Jean Whinghter, Christopher J. L. Cunningham & Steve M. Jex, PhD

Bowling Green State University

The antecedents and consequences of occupational health and safety problems associated with shiftwork are not domain-specific. For this reason, study of these issues as they relate to shiftworkers should not be limited to the workplace. The present study explored a topic related to two of NORA's 21 priority areas of study: Organization of work and Special populations at risk. Data were collected from both shiftworkers and their significant others in an effort to qualify and quantify the work- and family-related consequences of working swinging shifts. Strengths of the present study included the attention to multiple components of stress (e.g., psychological, physical and environmental factors), as well as multiple perspectives beyond just the individual shiftworker (i.e., significant others). Data were also collected over three stages, allowing the researchers to give initial consideration to change over time as well as avoiding many of the limitations associated with simple cross-sectional studies.

Results showed shiftworking tenure was negatively associated with most health and nonwork difficulties. Work-to-family conflict (WFC) was more prevalent than family-to-work conflict (FWC), with time-based WFC the most problematic type of conflict. In addition, WFC was linked to job stress, job satisfaction and life satisfaction; however, the direction and magnitude of correlations differed somewhat among phases and respondents. The results of this study contribute to the existing shiftwork literature by examining the influences of multiple components of stress (e.g., psychological, physical and environmental factors), as reported from multiple stakeholder's perspectives (e.g., the shiftworker and his/her significant other). Implications and plans for future research are discussed.

Poster Presentations

Poster#1 Health and Safety Training For Direct Care Providers of People with Dementia

Jennifer Gillespie
Bowling Green State University

Our objective is to conduct an education and training intervention for direct care providers of people with dementia that will increase the health and safety of both parties. Our specific aims are to develop, execute, and assess such an intervention. This research falls within the Intervention Effectiveness Research (IER) priority area under NORA guidelines, as it addresses the goals outlined by the NORA IER team.

Direct care providers of people with dementia will be recruited to participate through the co-investigators' many contact with nursing homes, hospitals, and assisted living facilities in 24 nearby counties. Some will participate in the intervention, and all will be asked to complete pre– and post-intervention surveys. Survey responses along with more objectives indicators of health and safety will be used to assess the intervention.

The two-component intervention will focus on effective care-giving relationships, which occur when the direct care provider effectively maintains the safety and health of both parties. The first component concerns Person-Centered Care (PCC), which is the new paradigm of dementia care (Kitwood & Benson, 1995). The second concerns emotional labor (EL), or the act of displaying appropriate emotion on the job (Hochschild, 1983). EL is relevant to occupational health in that health care jobs rank among the highest in terms of EL demands (Glomb, et al., 2004). EL is a work stressor (Grandey & Brauburger, 2002) and some forms of EL have been linked to all-cause mortality as well as to the incidence of coronary heart disease, hypertension and related risk-factors (Mauss & Gross, 2004). Some forms of EL are healthier than others (Gross, 2001), so, in addition to learning PCC techniques, direct care providers will become equipped to manage emotionally evocative situation so as to maximize the health and safety of care-giving relationships.

With the baby boom's retirement fast approach, dementia is a key public health concern. It is one of the most serious disorders affecting the elderly and is among the most feared of all later life conditions. Thus, increasing the health and safety of those affected and of their care-givers is important to public health.

Poster #2: Obesity Effects of Postural Stability During Standing

Woojin Park, PhD

University of Cincinnati

Obesity may be a risk factor for postural instability and hence loss of balance. Due to heavier body segment weight and abnormal body mass distribution, but limited strength, postural control may be inherently more difficult for obese individuals than non-obese individuals. Also, higher biomechanical muscle loadings due to heavier body weight may induce fatigue more rapidly for obese workers during prolonged manual work, which in turn may compromise postural stability more quickly.

Despite the prevalence of obesity, its effects on human balance maintenance ability during occupational tasks have not been extensively studied. No quantitative, empirical studies can be found in the ergonomics and the biomechanics literature that investigate effects of obesity on postural stability. This lack of knowledge limits our understanding of obesity as a risk factor for balance loss and fall accidents, and hampers attempts to develop methods for protecting obese workers from falls. Therefore, the purpose of this pilot study is to examine effects of obesity on postural stability during manual work. More specifically, non-obese and obese individuals will be compared in degradation of postural stability measured by postural sway during a prolonged static standing task. A prolonged static standing task is chosen, as it is a common occupational task across many different trades.

A balance assessment experiment will be conducted to accomplish the research goal. The experiment will be conducted at the Occupational Safety Motion Research (OSMR) Laboratory at University of Cincinnati (Room 414 Old Chemistry Building). 10 non-obese (18.5 kg/m^2 < Body Mass Index (BMI) < 25 kg/m^2) and 10 obese (BMI > 40 kg/m^2) subjects of similar stature (170~175cm) will be recruited as subjects. Subjects will perform quiet upright standing with their feet together for one-hour. A force plate (FP4060-08, Bertec Corp., Columbus, Ohio) will be used to record the center-of-pressure (CoP) position over time. The one-hour period will be divided into sixty one-minute intervals. For each interval, several CoP-based postural sway measures will be computed based on the CoP-time trajectory data: mean distance, RMS distance, mean velocity and peak velocity in both the medio-lateral (ML) and the anterior-posterior (AP) direction. Also, the CoP sway area will be computed as a postural sway measure. For each time interval and for each dependent postural sway measure, a t-test will be performed to compare the obese and the non-obese subject group. Linear regression analyses will be performed to evaluate changes in dependent postural sway measures with respect to time, and the significance of the slopes will be determined (^{1}0). Significance of all statistical tests are accepted when P£0.05.
The proposed pilot study, when completed, will provide an initial estimate of obesity effects on postural stability during prolonged standing task. Such preliminary data will provide a basis for further investigating obesity effects for various prolonged occupational tasks in the construction, manufacturing, and service industries.

Poster #3 Workplace Incivility Among Nursing Staff and Losses in Productivity

Scott A. Hutton & Donna Gates, EdD

University of Cincinnati

The financial cost of workplace violence is estimated to be 4.2 million dollars a year. Workplace violence is often started by a minor incident such as workplace incivility that spirals out of control. Workplace incivility, known

as a low-intensity, deviant behavior with ambiguous intent to harm, may initiate a spiral that for one thousand people a year ends in death at work. If an initial minor incident such as incivility could be mitigated, then the financial and human capital that could be realized is astounding. Direct care staff are at particularly high risk of being victims of workplace incivility. This increase in risk is because of the lack of trained staff, increased acuity of hospitalized patients, increased use of part time/ temporary/ agency staff and generalized loss of environmental control. The purpose of this cross sectional study is to examine the incivility experienced by direct care nurses in their workplaces. The specific research aims are 1) describe the extent of incivility experienced by nurses at their workplaces from patients, visitors and co-workers, 2) identify if demographics or employment characteristics are related to experiences of incivility by nurses, 3) determine if there is a relationship between incivility and work limitations due to absenteeism and impaired performance while at work (presenteeism) and 4) cost out losses in productivity to the healthcare organization when incivility is present. Three survey instruments will be used in this study 1) demographic and employment characteristics 2) the Work Limitation Questionnaire (WLQ) and 3) the incivility in Healthcare Survey (HIS). The WLQ will be used with direct care staff to assess losses in productivity. The IHS will assess direct care staff perceptions of incivility in the healthcare work environment. The surveys will be distributed to all direct care nursing staff at Christ Hospital and Saint Elizabeth's (North) Hospital. Data analysis will include descriptive statistics, frequencies, percentages, means and standard deviations. Bi-variate analysis will be done to identify relationships between employee variables and incivility experienced. Regression analysis will be conducted to identify relationships between incivility and productivity in direct care staff. The information obtained will serve two purposes. First, it will be shared with the hospitals in aggregate form to provide information for planning changes. Second, it will provide a base for further research into intervention studies to manage incivility.

Poster #4 *Personal Safety, Violence and Hospital Based Psychiatric Nurses and Workers*

Janet Wray, PhD
University of Cincinnati

The threat of violence in the workplace is an increasingly recognized concern for all nurses, with the level of threat to nurses in emergency and psychiatric settings being the most documented. Violence by hospitalized mentally ill patients against psychiatric care workers is a pervasive, long-standing, and well documented occupational health problem (Lanza, 1992). As a result, many violence prevention strategies and training interventions have been developed. However, there have been few data based evaluations of these strategies. Published research about perceived personal safety risks in psychiatric care provide little documentation about how individual, organizational, educational, and training factors enhance or impede the personal safety of mental health staff. The topic addressed in this research proposal is responsive to the NORA priority *Organization of Work.*

The purpose of this study is to describe psychiatric nurses' and workers' experiences of violence and aggression and how, individually and/or collectively, they go about ensuring their own safety and providing a safe environment for others.

The specific aims of this study are:

1. To investigate the experiences of psychiatric-nurses and other psychiatric hospital workers with aggression and violence from hospitalized psychiatric patients.
2. To promote a better understanding of the needs of psychiatric nurses and other psychiatric hospital workers who have experienced aggression and/or violence in the workplace.

3. To explore how psychiatric nurses and other psychiatric hospital workers go about ensuring their own safety and the safety of others in the workplace.
4. To explore how to balance staff security with therapeutic regard and kindness toward patients.
5. To provide an understanding of how perceived threats to personal safety may influence psychiatric patient care and patient outcomes.

Poster #5 *The Ergonomics of Electronic Medical Records*

Susan Kotowski, & Kermit Davis, PhD

University of Cincinnati

With advances in technology, health care facilities are beginning to embrace Electronic Medical Record (EMR) technology for numerous reasons including: ease of information sharing, reduced expenses, increased user and patient satisfaction over conventional paper record methods, increased productivity, and decreased medical errors. While numerous studies on EMR technology have examined satisfaction by users and patients, compatibility between the user and the interface (software), and economic impact of the technology; there has been a failure to investigate the potential ergonomic issues associated with implementation of EMR technology. Potential ergonomic issues include adaptability of the user to the technology (e.g. computer savvy individuals vs. individuals not as familiar with computers), issues with an aging healthcare workforce (e.g. declining vision, decreased dexterity), musculoskeletal discomfort associated with use of the technology (e.g. repetition during information input, and postures associated with using the device), and issues unique to the specific type of EMR input device (e.g. tablet, desktop, or laptop). There are two hypotheses for the proposed study. *First, it is hypothesized that musculoskeletal strain for EMR users will be prevalent in body regions different than those in the current paper and pen record keeping method.* It would be expected that how the nurses and doctors interact with the recording method would be significantly different and potentially stressful to different parts of the body. *Secondly, there will be ergonomic risk factors unique to each type of input device (tablet, desktop, laptop).* The size of the EMR will have a direct influence into how users interact with the devices, potentially resulting in different musculoskeletal stress. The proposed study will provide the first extensive ergonomic stress evaluation to determine the nuances of the interaction between the used and EMR.

Poster #6 *Predicting Youth Farm Injury: A Psychosocial Perspective*

Jennifer Yugo

Bowling Green State University

Youth farm workers are exceptionally vulberable to work injuries and illnesses because of two risk factors: age and industry. Farming consistently ranks among the nations most dangerous occupations, with high risks for fatal and non fatal injuries as well as chronic health conditions such as hearing loss, skin diseases and certain cancers.

The overarching goal of the proposed pilot study is to complete a holistic assessment of the predictors of injury to youth workers on farms. More specifically, while past research has looked at specific demographics, farm characteristics or psychosocial variables in isolation, the proposed research will analyze a multitude of these predictors in a comprehensive longitudinal design. To strengthen the causal validity of the results, this study will have a longitudinal design with participants completing measures three times at two month intervals. This re-

search will take place in the summer and fall months, when youth farm labor is most prevalent. Results of this pilot study will illuminate which predictors of injury generalize across all subareas of agriculture as well as predictors that are especially pernicious in a particular area. In the long term, this grant will serve as the foundation to create or enhance existing interventions for youth farm workers.

Youth farm injury is a compelling issue to industry, parents, adolescents, the medical community and farm organizations. Research in this area can inform these stakeholders on how to increase safety and reduce injury. As farms are often grouped together in certain areas, knowledge of the predictors of youth farm injury can be disseminated and interventions targeted at local levels.

Poster #7 Evaluating the NIOSH Lifting Equation for Obese Workers

Devender Singh & Woojin Park, PhD
University of Cincinnati

Studies have shown that obese individuals constitute a significant portion of the workforce today. Obese people, because of their heavier body mass due to excess body fat, may experience higher biomechanical stresses/loadings (e.g., spinal compressive forces) at the low back spine area than non-obese workers during common lifting activities.

Despite the prevalence of obesity and the potential LBD risks associated with it, currently, no ergonomic MMH evaluation/design tools exist, which are proven to be able to identify LBD risks for the obese population. The lack of MMH evaluation/design tools proven to be accurate for the obese population is problematic, because it represents a difficulty in protecting the emerging obese population from LBD risks.

Therefore, the objective of this pilot study is to determine whether a widely used lifting task evaluation/design tool, the 1991 NIOSH lifting equation, is capable of determining the safe load weight limits for the obese population, and thus, identify a need for modifying the NIOSH lifting equation for the special population of the obese individuals in future studies. In order to accomplish the research objective, the proposed research will biomechanically estimate static low back spinal compression forces experienced by obese individuals during various lifting tasks (non-repetitive) with NIOSH Recommended Weight Limits (RWLs), and compare them with the NIOSH Action Limit (AL) of spinal loading (3400 N). If static spinal compression forces experienced by obese individuals during lifting tasks with RWLs exceed the NIOSH AL, then it indicates that the biomechanical criterion that was used for the development of the NIOSH equation is violated, and the current NIOSH equation is not able to accurately quantify LBD risks for the obese individuals, at least, in light of its own biomechanical criterion. Thus, the Hypothesis to be tested is: Static spinal compression forces experienced by obese individuals during non-repetitive, one-time lifting tasks with RWLs (Lifting Index, LI=1) are equal to or less than the NIOSH action limit (3400 N).

A motion capture experiment will be conducted to accomplish the research goal. 40 obese individuals (20 moderately obese [30 kg/m^2<BMI<40 kg/m^2] and 20 morbidly obese [BMI>40 kg/m^2]) will participate in this experiment. In each obesity classification, we will consider 10 male and 10 female. Each subject will perform 16 different lifting tasks (2 H x 2 V x 2 D x 2 A) with the corresponding RWLs. Therefore, a total of 480 (30 subjects x 16

tasks) motions will be performed. Time trajectories of the positions of the optical markers will be obtained by the VICON motion capture system with a sampling frequency of 120 Hz. Joint angles will be computed based on the VICON marker position data according to the joint angle definitions of the 3DSSPP. Static low back spinal compression forces experienced by obese individuals while performing various lifting tasks (non-repetitive) with NIOSH recommended weight limits (RWL) will be computed using a biomechanical analysis software program (3DSSPP). A t-test will be used to investigate if the calculated mean L5/S1 spinal disc compression force is statistically less than NIOSH action limit (3400N). Significance of the statistical test will be accepted when $p \leq 0.05$.

Poster #8 *Comparison of Two Methods for Measurement Of Fungal (1-3)-p-d-glucan*

Yulia Iossifova

University of Cincinnati

Exposure to fungal (1-3)-β-D-glucans in the workplace is of increasing concern, but methods of assessing that exposure are not well defined. Currently there are two methods used for the analysis of (1-3)-β-D-glucans in the environment– the *Limulus Amebocyte* Lysate (LAL) assay, based on specific enzyme activation, and the inhibition Enzymatic Immunoassay (EIA), based on an antigen-antibody reaction. So far little is known on how these two methods compare, and data on their reliability as pure mold exposure surrogates are scarce and controversial. Thus this study will evaluate the sensitivity and specificity of two methods for assessing exposure to (1-3)-β-D-glucans in workplaces. This will be accomplished by comparing LAL and EIA analyzed (1-3)-β-D-glucan types and concentrations via samples spiked with known concentrations of linear (1-3)-β-D-glucan, and branched (1-3)(1-6)- and (1-3)(1-4)-β-D-glucan standards. (1-3)-β-D-glucans are of diverse structures and can cause a variety of biological reactions in vivo and in vitro experiments. Thus in order to explain the different health effects observed in occupational environments it is important to investigate the content and structure of (1-3)-β-D-glucans in the most common fungal species found in occupational organic dust and workplace indoor environments. This will be done by LAL/EIA analysis of selected indoor fungal species against linear (1-3)-β-D-glucan, and branched (1-3)(1-6)- and (1-3)(1-4)-β-D-glucan standards of known concentrations. This will help explain the various health effects observed after exposure to different types of mold , as well as to determine the most sensitive and specific assay for the analysis of (1-3)-β-D-glucan in occupational samples. These data can be used in future large-scale population-based studies to assess occupational mold exposures. The results from this study will also be used as the basis for an NIH grant application on the use of (1-3)-β-D-glucan as a measure of mold when investigating the mold-related respiratory health effects.

Poster #9 *Physical and Psychosocial Demands On Day and Nigh Shift in Nursing Homes*

Chunhui He & Kermit Davis, PhD

University of Cincinnati

Health care workers are experiencing increasing numbers of occupational injuries and illnesses. National data compiled by the Bureau of Labor Statistics (BLS) show that the rate of work-related injury or illness requiring medical treatment or lost work was 8.8 per 100 fulltime hospital workers, and 13.5 per 100 among nursing home workers in 2001. In addition to the highly involved physical demand, the nursing aids have extra stress from working extended hours (12 hours work days), dealing with life and death situations, high mental demands, less

of social activities (shift work) and potential violent acts from residents. These demands may be directly related to the shift that the nurse works (e.g. more demanding physically during day shift). Since better understanding of nurses' physical and psychological demands in nursing homes may help in designing interventions or policy development to decrease injury rate and turnover. Therefore, the objective of this study is to differentiate and quantify the physical and psychosocial demands among nurses working on day and night shift, as well as to investigate any musculoskeletal disorders among day and night shift nursing assistants working in nursing homes.

Poster #10 Evaluating Vapor Intrusion from Gasoline Underground Storage Tanks

Sheryl A. Milz, PhD
Medical University of Ohio

Vapor intrusion is the movement of volatile chemicals from contaminated soil into buildings and their airspace. Gasoline releases result in petroleum constituents contaminating soil. The overall goal of this pilot project is to evaluate the potential for exposure from vapor intrusion of workers within operating establishments surrounded with petroleum contaminated soil from previously leaking underground storage tanks. The volatile petroleum constituents of interest are benzene, ethyl benzene, toluene, and xylenes. Specific aims of the project will be to systematically characterize the airborne concentrations of the volatile petroleum constituents of interest, to determine the proportion of the airborne concentrations attributed to vapor intrusion, and then to compare the measured airborne concentrations with the results from the USEPA vapor intrusion model. To accomplish these aims area air sampling will be conducted over a 24-hour period both inside and outside of three sites with a prior gasoline release. Measured subsurface contaminant levels along with geologic conditions and hydrogeologic conditions will also be obtained for the three participating facilities through Freedom of Information Act requests in order to utlize site specific information in the USEPA vapor intrusion model. Statistical analylsis will be used to compare the results from the area air sampling and the vapor intrusion model at each of the three sites.

The National Institute for Occupational Safety and Health (NIOSH) and its partners established the National Occupational Research Agenda (NORA) in 1996 to guide research in 21 priority areas. The four areas addressed by this pilot project are indoor environments and mixed exposures, under the work environment and workforce grouping, and exposure assessment methods and risk assessment methods, under the research tools and approaches grouping.

NOTES

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Education and Research Center
Pilot Project Research Program

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Participating Universities

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