

**NORTH CAROLINA
OCCUPATIONAL SAFETY AND HEALTH EDUCATION AND RESEARCH CENTER**

SUMMARY ANNUAL REPORT

July 1, 2007 – June 30, 2008

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SUBMITTED BY:

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North Carolina Occupational Safety and Health Education and Research Center

The purpose of the North Carolina Occupational Safety and Health Education and Research Center (NC OSHERC) is to train practitioners and researchers in the academic disciplines of Industrial Hygiene (IH), Occupational Health Nursing (OHN), Occupational Medicine (OM), Occupational Safety and Ergonomics (OS&E), and Occupational Epidemiology (OE). The program also provides continuing education for professionals in these areas who seek to maintain and update their skills. Program trainees will be well equipped to achieve the occupational safety and health objectives outlined in Healthy People 2010 and continue to develop skills as addressed in the IOM report: Safe Work in the 21st Century. The NC OSHERC is administered by an Executive Committee consisting of Center Director (Bonnie Rogers, DrPH, COHN-S, LNCC, FAAN) who also serves as the Program Director for OHN; Deputy Director (Judy Ostendorf, MPH, COHN-S, CCM, FAAOHN); Leena Nylander-French, PhD, IH Program Director; Dennis Darcey, MD, MSPH, FACOEM, OEMR Program Director; David Kaber, PhD, OS&E Program Director; David Richardson, PhD, OE Program Director; and Kathleen Buckheit, MPH, Director of Continuing Education and Outreach Program. All programs are located at the University of North Carolina, Chapel Hill, except OEMR which is at Duke University and OS&E which is at NCSU.

This report focuses on major accomplishments/highlights in program areas, including the impact of ERC programs within the applicable DHHS Region IV. The period covered by this report is 7/1/07-6/30/08. During this period, the following major accomplishments have been achieved.

Major Accomplishments

Outreach efforts have been outstanding by all faculty with enormous amounts of participation with community and fostering translation of research to practice via numerous publications, collaborative sponsorships of courses, presentations, and consultations. Our NORA Interdisciplinary Seminar Series is presented on campus and webcast so that all NIOSH funded students can attend these required seminars along with outreach to the larger occupational safety and health community. During this reporting period, participation increased with an average attendance of 138 per seminar. The April 2008 seminar on Obesity in the Workplace had an attendance high of 269. All disciplines have been represented. In addition to the U.S., international participants included Canada, India, Israel, Korea, Chili, Sweden, Brazil, Taiwan, and Singapore. The NORA Interdisciplinary Seminar Series has continued to discuss research pertinent to NORA.

A NC OSHERC Newsletter (News-E) was developed and distributed to 17,875 members of the occupational safety and health community. It included information about each ERC program area and pertinent information about safety and health.

Industrial Hygiene Program - Director: Leena Nylander-French, PhD

The industrial hygiene faculty identifies itself as the Exposure Assessment and Control (EAC) focus group, which includes industrial hygiene, exposure assessment, and air pollution control. EAC faculty has been actively collaborating in joint research projects and educating and training our Master's and doctoral students. The NIOSH-ERC traineeships supported 2 Master's and 2 doctoral students during fall 2007 and 1 Master's and 3 doctoral students during spring 2008. Two NIOSH supported Master's students graduated during the academic year 2007-2008. One Master's graduate is continuing in our doctoral program and one accepted a civilian industrial hygienist position in the U.S. Armed Forces. Currently, we have 3 doctoral students (includes 1 minority student) supported with NIOSH-ERC funding.

Three of the NIOSH-ERC trainees presented their research findings in both national and international scientific meetings while over 20 EAC student presentations (oral or poster) were given in both national and international meetings. Two doctoral NIOSH-ERC trainees were selected as recipients of 2008-2009 American Industrial Hygiene Foundation (AIHF) scholarships. Jennifer Thomasen received the American Industrial Hygiene Foundation Scholarship and Sheila Flack received both the Carolinas Local Section Scholarship and the Fred

Venable/Deep South Local Section Scholarship awards. In addition, they both were recognized for their research accomplishments at the AIHce 2008 in Minneapolis. Jennifer Thomasen received the Best of Session, First Place Student Poster Award for her poster "J. Thomasen, K. Fent, and L.A. Nylander-French: Field Comparison of Air Sampling Methods for 1,6-Hexamethylene Diisocyanate". Sheila Flack received the Best Student Poster Presentation Award in Biological Monitoring Session for her poster "S. Flack, K. Fent, L. Gaines, J. Thomasen, L.M. Ball, S. Whittaker and L.A. Nylander-French: Quantifying 1,6-Hexanediamine in the Plasma of Workers Exposed to 1,6-Hexamethylene Diisocyanate".

Occupational and Environmental Medicine - Program Director: Dennis Darcey, MD, MSPH, FACOEM

The major goal of the Duke Occupational and Environmental Medicine Residency (OEMR) program is to train ethical, board-certified, occupational and environmental physicians who possess the knowledge and skills necessary to provide occupational and environmental health professional services in a wide variety of settings, including academia, public health agencies, corporate occupational health, and community based clinical occupational medicine. OEMR is based in the Division of Occupational and Environmental Medicine within the Department of Community and Family Medicine (CFM) at Duke University Medical Center. The program is fully accredited by the Accreditation Council for Graduate Medical Education (ACGME) and is as a core program in the NC OSHERC. The UNC School of Public Health provides academic programs to fulfill the Master's in Public Health degree.

The NIOSH-ERC traineeships supported 3 OEMR residents and the program graduated 2 residents during the 2007-2008 year. John Paul Longphre MD, MPH is now working in North Carolina as the Southeast Regional Medical Director for Work Care, a national occupational consulting firm. Another recent graduate Hassan Zakaria, MD, MPH, is Occupational Medical Director for a regional medical center in Colorado Springs, CO.

During this reporting period, the OEMR Program and faculty provided 30 consultations with professional, industry, labor, and government groups and 15 worksite consultations, training programs, interventions. Also, each year approximately 60-hours of seminar / journal club CME in occupational health are offered to occupational health professionals from central North Carolina. Continuing Education Programs provided by OEM faculty over the last year include the training of 1,783 occupational health professionals from medicine, nursing, safety, and industrial hygiene employed in industry, government, and academia. The Annual Carolinas Occupational Medicine Conference is sponsored by the NC OSHERC. Duke OEMR residents participated in a number of research projects and presentations.

Occupational Health Nursing Program - Program Director: Bonnie Rogers, DrPH, COHN-S, LNCC, FAAN

The Occupational Health Nursing (OHN) Program has been part of the NC OSHERC for almost 30 years. The goal of the Program is to provide education, training, and research experiences as appropriate to occupational health nursing professionals, so as to transfer learned knowledge to protect and promote the health of the workforce. During this reporting period we admitted 2 MPH and 8 certificate trainees while 3 certificate trainees graduated in August. Trainees and graduates received awards at the AAOHN Symposium in Salt Lake City, Utah and the UNC School of Public Awards Day. Two program graduates published 11 articles in professional publications. One of our program graduates was elected to the Board of Directors for the Illinois Association of OHNs and the Director of Awards, Scholarship and Media.

The National League for Nursing Accrediting Commission, Inc. (NLNAC) reviewed the OHN Self Study, conducted a three day site visit, and granted an eight year reaccreditation to the OHN Program.

The OHN Program continues to actively participate in the NC OSHERC continuing education/outreach efforts. We offer the "OHN Certification Review and the Occupational Health Nursing: Introduction to Principles and Practice" courses every year. Three OHN faculty are on the Education and Standards Committee of NCAOHN,

which plans the continuing education programs offered semi-annually, for occupational health nurses throughout the state.

Occupational Safety and Ergonomics Program - Program Director: David B. Kaber, PhD

This past year, the major accomplishments for our program area included supporting 4 trainees with the NIOSH-ERC traineeships, graduation of 1 masters student, student publication and preparation of several conference proceeding papers, and recruiting of two PhD students and one masters student. Lashanda Lee graduated with her masters degree and completed a thesis on the development of integrated measures of usability for commercial web interface design. She also published a paper based on her thesis through the *Human Factors & Ergonomics Society* Annual Meeting. In addition to this, Megan Garner and Lashanda Lee both submitted papers to the *International Ergonomics Association* (IEA) Conference, based on lab teamwork, including a study of the effects of driver age and stress disposition on situation awareness under hazardous conditions. These papers are expected to appear at the *IEA* Meeting next year. The PhD students we recruited to the training program, included Karen Deurquidi (for spring term admission) and Matt Diering (for admission in fall 2008). Karen was the first female PhD student we supported through the NIOSH grant and Matt is an outstanding NC State undergraduate industrial engineering student, who also received a Dean's Fellowship and Graduate Research Fellowship Supplement. Theo Veil was recruited from our undergraduate program for completion of a masters degree with thesis.

The major impacts our program area has had on the region have occurred through distance education programs at NC State, industry-sponsored applied research, and basic research studies with community care facilities. This past year, we offered "Human Factors & Systems Design" (ISE 540) through the NC State Engineering On-line Program. Seventeen off-campus students enrolled in the course, including industry professionals from North and South Carolina. We continue to offer Occupational Biomechanics, and Bayesian Decision Analysis for Human Performance through the on-line program. With respect to industry research, one of the NIOSH trainees (Veil) participated in an ergonomics program implementation project for Duke Energy (DE) to deliver an employee-training program and to conduct job analyses for hazard identification and control. The student worked with ergonomists at the Ergonomics Center of NC and identified high-risk jobs and participated in reporting to DE. This work was considered very useful by a DE Ergonomics Focus team and will be followed by lab studies on specific jobs at NC State this fall. Finally, another student trainee (Lee) participated in a research study with two local nursing homes on the design of mobile robot features (faces, voice capabilities, interactive capabilities) for delivery of medicine to senior residents and to support positive emotional experiences. The study revealed a high degree of acceptance of the robot technology by senior citizens and was publicized in a local newspaper (Cary News).

Occupational Epidemiology - Program Director: David Richardson, PhD

Occupational Epidemiology is an allied research training program that has been part of the NC OSHERC since 2001. Dr. David Richardson serves as program director, with 7 core faculty and 10 adjunct faculty supporting the training program in epidemiology. We engage trainees in high-quality research on occupational health and safety. The NIOSH-ERC traineeships supported 2 trainees during this reporting period. There are currently 2 trainees in the EPID doctoral program. Ghassan Hamra is currently working on development of a dissertation project which will focus on risk assessments for tritium exposures accrued by employees at the Savannah River Site (SRS) nuclear facility. He intends to evaluate the relative biological effectiveness of tritium in relation to gamma exposure. His masters thesis was recently published in *Radiation Protection Dosimetry* (2008). In addition, he presented a poster of this work at both the 2008 International Society of Exposure Analysis conference in Durham, NC and the 2008 CORE health effect of low level radiation conference in Ambleside, UK. The other trainee, Steven Lippman is developing a dissertation in the area of occupational injury epidemiology.

Continuing Education Program - Program Director: Kathleen Buckheit, MPH, COHN-S/CM/SM

Since 1976, the Continuing Education (CE) Program has provided quality opportunities for occupational safety and health professionals. Based on the ongoing use of needs assessments, course evaluations, outreach, and recruitment activities, a need for this CE is evident and guides the choices of courses offered. This is due in part to the ever-changing needs of practitioners and an interdisciplinary approach to CE. Course evaluations serve as quality assurance that courses are effectively and efficiently delivering the CE programs and services. CE Program objectives are used as measures of success and are being met. Faculty participation includes the academic and non-academic faculty who are experienced practitioners and consultants. Both continue to engage in outreach with professional associations and participate as course directors, planners, presenters, evaluators, and technical advisors from the various disciplines offering a unique blend of theoretical and practical experience.

Several new courses are offered every year and were presented in partnership with the Carolinas Occupational and Environmental Medicine Association (COEMA) Annual Symposium and two NC Association of Occupational Health Nurses (NCAOHN) Semi-annual Conferences. This year we presented the first Annual Regional ERC Symposium with the Sunshine and Deep South ERCs, increasing regional focus, breadth of topics, and collaboration with other ERCs.

Trainee recruitment, including diversity efforts, meets the training needs of the region. The geographic statistics indicated that 85% of the trainees were from the southeast region. For 2007-2008, the diversity breakdown of attendees reporting their ethnic background was: White - 70%; Black - 20%; Hispanic - 6%; Asian - 2%; American Indian - 1%; Other - 1%. The CE Program trained **4,160** of students in **120** courses.

Future efforts include meeting our goals and objectives through outreach and strengthening partnerships with professional and technical organizations, local and state government agencies, and increased marketing throughout the Southeast region, which includes opportunities to recruit minority and union students into CE courses of all disciplines.