

NIOSH-supported Education and Research Centers (ERCs) Justification Statement

Background

Through the 17 university-based ERCs across the US, NIOSH supports 87 interdisciplinary graduate degree programs and research training in the occupational safety and health core areas of industrial hygiene, occupational health nursing, occupational medicine, and occupational safety, plus specialized areas relevant to the occupational safety and health field. Graduates are employed in professional positions in institutions including: businesses, industries, academia, government agencies, labor organizations, health agencies, and health care facilities. Each ERC also has a vigorous continuing education program for occupational safety and health professionals and others with worker health and safety responsibilities. These programs assure rapid transfer of the newest information to improve worker health and safety to the workplace.

Mission

The ERCs have a unique mission: Address occupational safety and health professional practice and research training in an inter-disciplinary environment. This results in cross-fertilization that directly impacts safety and health practice in the workplace.

Implementation

ERCs provide reviewed, accredited educational programs and undertake projects that focus on solving real problems and then transfer solutions to the workplace, following the NIOSH research to practice (r2p) initiative. The ERCs play a significant role regionally and nationally in moving newly documented best practices to the workplace to reduce or eliminate workplace injuries, illnesses, and deaths. ERCs are the regional and national resource on occupational safety and health issues for business, labor, government, and the public.

ERC Value

- Supply over 75% of the USA's occupational safety and health professionals in specialty areas like occupational medicine and advanced injury prevention.
- Provide 440,000 person-hours of professional development training for practicing safety and health professionals in 10,000 businesses.
- Give aid and consultation to over 5,000 small, medium and large-sized US businesses annually.
- Develop the major research innovations needed to prevent occupational injuries and diseases.
- Serve as the primary source of accessible experts to the public and government leaders for occupational safety and health issues and does not duplicate any other US government program.
- Encourage and support professional certification.
- Provide this country's workforce with the occupational safety and health (OSH) expertise needed to minimize worker's compensation costs.

Consequences of Reduced Funding

- Marked reductions in numbers and quality of trained OSH professionals for employment in business, government, labor and universities.
- Loss of the primary source of occupational safety and health training for businesses.
- Reduced resources for businesses to develop safety programs.
- Reduced ability of OSH professionals to maintain professional certification.
- Elimination of the main academic sources responsible for over \$20B in worker's compensation cost savings.
- Elimination of OSH educational services to over 10,000 U.S. businesses.

How ERC's have helped businesses (e.g.):

ConAgra Foods: The ERCs help students develop skills to provide the basis for action, reduce costs and create or maintain jobs through research to practice (r2p). For example, some microwave popcorn manufacture is associated with life-threatening airway obstruction. ConAgra has removed diacetyl from the flavoring formulation and the data from this study are being used by others to limit exposure in other workplaces.

BP: The Sunshine Education and Research Centre at the University Of South Florida (USF) worked to help improve BP's heat stress programs for responders during the Deepwater Horizon Deepwater Incident Response. ERC staff visited the regional response headquarters at Mobile, AL and Houma, LA and worked with the Unified Area Command to modify and unify BP's program.

SENES Consultants Limited is a company that specializes in the fields of energy, nuclear, and environmental sciences. Since its inception in 1980, the company has participated in over 4,800 projects throughout Canada, United States, South America, the Caribbean, Africa, Australia, Europe, Asia, the Middle East and the Far East. SENES employs over 200 professional scientists, engineers and support staff in offices throughout North America and around the world. Over the past year, SENES has hired several former graduates of the health physics program at Colorado State University. These students have come to us in industry with excellent foundations in physical science and health physics. The funding provided to them by NIOSH through the Mountains and Plains (MAP) ERC has, in my view, been an important factor in facilitating the high quality of young people being trained by this program.

OsteoDynamics, Inc: Currently each year in the United States, there are 2 million osteoporosis related bone fractures, contributing to 300,000 deaths and \$20 billion in direct healthcare costs. OsteoDynamics, Inc is a newly formed medical device company working to commercialize a new non-invasive (without ionizing radiation) diagnostic technology invented and developed by Dr. Bhattacharya, a member of the UC ERC Faculty, and his colleagues at the University of Cincinnati. This new technology is called Bone Shock Absorbance (BSA) and will improve the diagnosis and management of osteoporosis. The BSA test data collection requires patients to simply hit a force sensing plate with their heels five times and then the results are processed with custom software to obtain the appropriate bone shock absorbance values. The technology allows better identification of patients with high risk of bone fracture. OsteoDynamics resides in Cincinnati, Ohio, where its continued success and growth will result in the creation of high skill and high wage employment for the Cincinnati economy. (A graduate of the UC Education and Research Center is employed by OsteoDynamics.)

The Embody Chair: Faculty from the Northern California ERC at UC San Francisco assisted designers from Herman-Miller, a furniture manufacture from Michigan, in the design of their latest office chair, the Embody. The armrests on the chair are adjustable and were designed to provide a comfortable surface for supporting the forearms when using a computer. Some of the design features help promote the productivity of office workers by reducing fatigue. The chair was released in 2010 and so far, tens of thousands have been sold.

Alternative Keyboard: Faculty from the Northern California ERC at UC San Francisco conducted research on the physiology of the carpal tunnel. These data have been used by keyboard designers at Microsoft and Logitech to design alternative design keyboards (e.g., the Microsoft Natural, Microsoft Comfort, Logitech Wave). In 2004 an engineering PhD graduate from the UC Berkeley ERC was hired by Microsoft to continue work on the keyboard. These keyboard designs have been the best selling retail keyboards in the US for the past 5 years. For the month of December 2010, the combined sales of these keyboards was \$3.3 million. These designs have been demonstrated, in two studies, to prevent musculoskeletal problems in the hands of computer users.

Treatment Guidelines: Faculty from multiple ERCs under the leadership of the Rocky Mountain ERC at the University of Utah have developed treatment guidelines for the American College of Occupational and Environmental Medicine to treat workplace injuries. These guidelines have synthesized over 15,000 studies into 2,500 treatment recommendations for all common workplace disorders. These guidelines have been implemented in several states, dozens of businesses and nearly all major workers compensation insurers with costs savings estimated at over \$20B.

How ERC graduates have served homeland security, the military, the government and the community:

- During the course of my employment with Honeywell Sensing and Controls in Freeport, IL, I was able to use my training to help reduce costs associated with injuries. This particular facility was a major supplier to Chrysler and General Motors and in order to remain competitive with overseas suppliers, we needed to control all costs, especially those which cannot be foreseen and accounted for ahead of time. Clearly, injury prevention keeps costs under control and helps make the case to keep production in the United States.
- I am now applying my training from the ERC to help protect researchers, healthcare providers, and associated support personnel at the University of Chicago. Major accidents would be a major setback for the University's ability to conduct world-renown research and to provide top-quality healthcare to the Chicago community. While the direct costs of workplace accidents to the University are significant enough, the indirect costs to those who rely on the University are even greater.
- After receiving my Masters of Public Health, I re-entered the work force in injury prevention, specifically among women experiencing intimate partner violence. I decided that not enough was being done for women in this devastating position, particularly in their work settings. Through my years of training at the Heartland ERC, I learned that if the women are given the proper tools and safety techniques in their jobs they can continue to be employed, which reduces the strain placed on our unemployment and workforce development systems.
- I work as a contractor for the Department of Homeland Security's BioWatch program, which is a nationwide bio-surveillance system designed to detect the intentional release of select aerosolized biological agents (i.e. a bioterrorism attack). 90% of my time is spent designing, conducting and evaluating exercises for cities involved in the program. I also provide expertise on environmental sampling and personal protective equipment for program guidance documents. Between getting my BS and MS I spent 7 years in the active duty Air Force as an industrial hygienist. My military background and degree in Industrial Hygiene from the Midwest Center for Occupational Health and Safety were what got me this job.
- As an Occupational Medicine physician practicing in Waterloo, IA, I serve a client base that includes 5000 corporate clients. We work with these clients in a variety of ways including performing OSHA mandated examinations and screening, DOT regulated physical examinations and drug testing, worker injury care, post-offer pre-placement examinations, and expert opinions. In doing so, we help identify early medical problems and mitigate worker and company risk as well as assist in safeguarding the public. For example, as Occupational Medicine physicians we regularly perform medical certification for Commercial Drivers regulated by the DOT and identify drivers at risk for Obstructive sleep apnea (OSA), a significant risk factor for safety and health and a significant cause of motor vehicle accidents (MVA). OSA has also been shown to increase the risk of heart failure, stroke, hypertension, and mood disorders. A recent study published in *Journal of Occupational and Environmental Medicine*, showed that commercial drivers treated for sleep apnea had health plan savings averaging \$2700 in the first year and another \$3100 the second year compared to no change for untreated drivers. The treated drivers also missed fewer work days (average 4.4 days in the first year) and had lower short-term disability costs (\$528 over two years). In addition, the treatment of sleep apnea in commercial drivers helps protect the public by decreasing the chance a driver will fall asleep at the wheel.
- Troops in Iraq and Afghanistan survive with more severe wounds than those from previous wars because of advances in body armor, field hospitals, and evacuation flights. However, these successes yield a growing population of severely wounded veterans who will need a lifetime of care. Stephen Hunt, National Director, VA Post-Deployment Integrated Care Initiative, VA Puget Sound Health Care Systems, directs a multidisciplinary post-combat assessment and follow-up clinic for returning veterans in the Puget Sound area. He also co-chairs the national Technical Assistance Team, providing leadership for a national Department of Veterans Affairs (VA) initiative for establishing similar integrated post-combat care clinics nationwide. He states the Occupational and Environmental Medicine (OEM) program enhanced his clinical work, expanded his research capabilities, opened up additional teaching and training opportunities, and contributed to his professional development in innumerable other ways. He applies the principles of occupational and environmental medicine, and preventive health care daily in his clinical care of veterans who have suffered the traumas of war and combat. These principles also guide his development of programs for comprehensive post-combat services.

- The US Coast Guard has 42 units providing search and rescue, law enforcement, and environmental protection services in Northern California. All involve potentially hazardous work. Lieutenant Michael Box, an alumnus of the Northwest Center for Occupational Health and Safety undergraduate and master's programs, is responsible for the health and safety of more than 3,000 Coast Guard personnel in that region. He is based in the only remaining military treatment clinic in the greater San Francisco Bay area. As a Safety and Environmental Health Officer, he supervises, plans, budgets, and implements an environmental health, safety, and industrial hygiene program. He is part of a team that provides environmental health, industrial hygiene, safety, and ergonomics services for Coast Guard personnel and units. One of his assignments was to find better ways for the crews of 47-foot motor lifeboats and helicopters to communicate with each other during noisy rescue operations. His work led to recommendations for improved communications gear and hearing protection, which are currently being field tested.

- After receiving my PhD in Epidemiology, I was recruited by the NIOSH. Since joining NIOSH, I have impacted a wide number and variety of American workers. I have:
 - Participated in occupational fatality investigations that led to recommendations for protecting the 165,700 cement masons employed in the US (Occupational Employment and Wages, May 2009).
 - Participated in the federal response to the Deepwater Horizon Oil Spill by collecting data on the over 25,000 contract workers hired to perform oil spill cleanup duties.
 - Directed a research study on workplace violence among Pennsylvania educators. Findings will be used to develop violence prevention programs for the 260,000 education workers in PA.
 - Currently directing a research study on the prevention of motor-vehicle crashes among the 5,132 Iowa Law Enforcement officers.