Occupational Health and Industrial Hygiene

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Supplement Aims and Scope

This supplement is intended to focus on the identification and characterization of workplace hazards and associated risks for human health and the environment and development, implementation and evaluation of prevention or intervention strategies to limit workplace hazards and associated risks.

Environmental Health Insights aims to provide environmental health practitioners, researchers and the general public with online, open access to scholarly articles on environmental health hazards and associated risks. The journal aims to explore how these hazards and risks can be eliminated or limited or prevented to help protect human health and our environment.

In a field where the literature is ever-expanding, practitioners and researchers increasingly need to have ready access to up-to-date, high-quality scholarly articles on areas of on-going interest in environmental health. This supplement aims to address this need by presenting contemporary articles by leading scholars, allowing readers to distinguish the signal from noise. We hope that through this effort practitioners and researchers will be aided in finding answers to some of the most complex and pressing issues of our time.

Occupational Health Research at NIOSH

The National Institute for Occupational Safety and Health (NIOSH) is the U.S. federal agency that conducts research and makes recommendations for preventing work-related injuries, illnesses, and deaths.[1] The work by NIOSH protects the safety and health of the nation's 155 million workers.[2] NIOSH provides the only dedicated federal investment for research needed to prevent the societal cost of work-related fatalities, injuries and illnesses in the United States, estimated in 2007 at $250 billion in medical costs and productivity losses alone.[3] NIOSH produces new scientific knowledge and provides practical solutions vital to reducing risks of injury and death in the workplace.[1] NIOSH scientists design, conduct, and support targeted research, both inside and outside the institute, and support the training of occupational health and safety professionals to meet increasing needs for a new generation of skilled practitioners.

The primary goal of this supplement to Environmental Health Insights is to highlight the diversified occupational health and industrial hygiene research program of NIOSH. A group of nine papers that address important research areas of NIOSH have been selected for inclusion in the supplement. The supplement includes manuscripts that describe experimental studies which examine specific workplace problems as well as papers that review the scientific literature related to emerging issues in occupational health.

Thousands of workers are exposed to fumes emitted during welding in the U.S. daily.[4] Two papers in the supplement highlight research that has attempted to make the workplace safer by reducing fume emissions and replacing potentially hazardous materials used in welding with safer alternatives. These studies address important NIOSH construction-related research which is specifically focused on reducing welding fume exposures.

Work-related musculoskeletal disorders are prevalent across the world and associated with chronic pain and physical disability.[5] Another important NIOSH construction-related research goal is to reduce the incidence and severity of work-related musculoskeletal disorders among construction workers in the U.S. Three papers in the supplement examine the findings from studies that assess the effects of work and occupational strain leading to musculoskeletal disorders.

The potential health effects associated with exposure to engineered nanomaterials is a priority research area of NIOSH and has led to the development of the NIOSH Nanotechnology Research Center (NTRC). As such, one study described in this supplement evaluates the potential bio-reactivity of silicon nanowires, an emerging engineered nanomaterial that now is commonly used in the technology and manufacturing fields.

By using a novel inhalation exposure system, another study examines the potential pulmonary and cardiovascular effects associated with exposure to a material that was used as an

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oil-dispersant in response to the U.S. gulf coast 2010 Deepwater Horizon oil spill. NIOSH played an important role in assessing the potential adverse health effects on workers involved in the oil spill cleanup and recovery.[6]

The U.S. Centers for Disease Control and Prevention (CDC)-NIOSH estimates that more than 13 million workers in the U.S., spanning numerous occupational industries and sectors, are potentially exposed to chemicals that can be absorbed through the skin.[7] One manuscript in the supplement reviews examples of chemicals from each of the NIOSH National Occupational Research Agenda sectors to provide a review of the known and emerging issues associated with occupational skin disorders and to increase awareness about potential health hazards.

Finally, a second review paper examines the potential contribution of work-related stress to the development of cardiovascular disease and diabetes, two diseases that fall into the top ten causes of death worldwide.[8] The etiology of these diseases is complex, and work-related stress is one factor that has been implicated in increasing the risk of developing them.[9] These concepts are briefly reviewed in this supplement.

The Occupational Safety and Health Act of 1970 established NIOSH which currently is part of the CDC, in the Department of Health and Human Services. NIOSH partners with the Occupational Safety and Health Administration (OSHA). OSHA is part of the U.S. Department of Labor, and it develops and enforces workplace safety and health regulations. During its development, NIOSH has grown to more than 1,200 employees from a diverse set of fields including epidemiology, medicine, nursing, industrial hygiene, safety, psychology, chemistry, statistics, economics, toxicology, and many branches of engineering.[1] For more information about the research program and priorities at NIOSH, visit: http://www.cdc.gov/niosh/

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