International Journal of Occupational and Environmental Health

ISSN: 1077-3525 (Print) 2049-3967 (Online) Journal homepage: http://www.tandfonline.com/loi/yjoh20

# New Reports from the NIOSH Health Hazard Evaluation Program

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**To cite this article:** none (2009) New Reports from the NIOSH Health Hazard Evaluation Program, International Journal of Occupational and Environmental Health, 15:4, 416-417, DOI: 10.1179/oeh.2009.15.4.416

**To link to this article:** http://dx.doi.org/10.1179/oeh.2009.15.4.416

Published online: 19 Jul 2013.

# New Reports from the NIOSH Health Hazard Evaluation Program

With each issue, the *International Journal of Occupational and Environmental Health* publishes a selected set of abstracts of important Health Hazard Evaluations (HHE) from the National Institute for Occupational Safety and Health (NIOSH) of the US Centers for Disease Control and Prevention. These abstracts and the full HHE reports are also available on the NIOSH web site: http://www.cdc.gov/niosh/programs/hhe.

**Physical and Mental Health Symptom Assessment in New Orleans Police Department Personnel 15 Months after Hurricane Katrina**

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*Charles Mueller, MS*
*Bruce Bernard, MD, MPH*
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The HHE Program responded to a request for assistance concerning continuing respiratory, gastrointestinal, and mental health symptoms among New Orleans Police Department personnel who responded to Hurricane Katrina. Fifteen months after Hurricane Katrina, HHE Program investigators conducted a survey of physical and mental symptoms and compared the responses of participants who also completed a previous NIOSH survey done two months after the hurricane response. Investigators found the prevalence of upper respiratory symptoms, cough, post traumatic stress disorder, and depressive symptoms were similar at both surveys. Investigators also found that more gastrointestinal symptoms and lower respiratory symptoms were reported in the second survey. Reporting respiratory and gastrointestinal symptoms was significantly associated with reporting symptoms of depression and post traumatic stress disorder. HHE Program investigators recommended that managers continue to encourage personnel with ongoing symptoms to seek follow-up with a healthcare provider and that an employee assistance program be implemented for those in need of ongoing psychological support. Investigators also recommended that pre- and post-exposure medical screening be conducted for personnel involved in disaster response and that existing disaster preparedness programs address health and safety needs of responding personnel. The final report is available at: http://www.cdc.gov/niosh/hhe/reports/pdfs/2007-0067-3076.pdf.

**UV-C Exposure and Health Effects in Surgical Suite Personnel**

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The HHE Program responded to a request at a hospital regarding concerns from surgical staff about skin and eye symptoms that were thought to be caused by ultraviolet wavelength C (UV-C) radiation produced by ultraviolet lamps. These lamps are mounted on the ceilings of orthopedic operating rooms to aid in intraoperative infection control. HHE Program investigators interviewed employees about possible work-related skin and eye symptoms and used personal dosimeters to measure UV-C exposure to surgical staff during procedures. Investigators also looked at how well personal protective equipment (PPE) protected workers from UV-C radiation. Investigators found that UV-C exposure was 6 to 28 times greater than the NIOSH recommended exposure limit (REL) when dosimeters were placed outside hospital-approved PPE and UV-C exposure was well below the NIOSH REL when dosimeters were placed beneath hospital-approved PPE. Investigators found that skin and eye screening records did not report changes that were thought to be caused by UV-C exposure. HHE Program investigators recommended that facility managers remove UV lamps fixtures in operating rooms to prevent UV-C exposure during procedures and continue annual skin screenings for employees previously exposed to UV-C. Since the NIOSH investigation, the facility has stopped using ultraviolet germicidal irradiation in the operating rooms and relocated the orthopedic operating room suite into an area equipped with laminar airflow, an alternate form of infection control technology. The final report is available at: http://www.cdc.gov/niosh/hhe/report/pdfs/2007-0257-3082.pdf.

**Findings from Industrial Hygiene Air Sampling, Ventilation Assessment, and a Medical Survey at a Facility that Manufactures Flavorings, Modified Dairy Products, and Bacterial Additives**

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The HHE Program responded to a request to investigate the risk

of respiratory problems from exposures to diacetyl, butter flavorings, cheese flavorings, enzymes, colors, bacterial cultures, and cleaning agents at a flavorings manufacturing plant. HHE Program investigators measured air concentrations of flavoring chemicals and dust and evaluated the effectiveness of ventilation systems. Investigators also interviewed workers, measured their lung function, and conducted methacholine challenge testing to identify hyperreactive airways. HHE Program investigators found that air concentrations of diacetyl in certain areas of the facility were similar to concentrations measured at other plants where workers have developed severe lung disease, likely caused by exposure to diacetyl and possibly other flavoring chemicals. Investigators measured high diacetyl concentrations during tasks involving the manual pouring of diacetyl or diacetyl-containing starter distillate and during cleaning activities. HHE Program investigators recommended that facility managers provide respiratory protection, protective clothing, eye protection, and gloves for employees who work in areas of potential exposure, and that employees wear personal protective equipment as directed by management. Investigators also recommended that the facility perform baseline spirometry tests and repeat spirometry tests for workers. The final report is available at: http://www.cdc.gov/niosh/hhe/reports/pdfs/2007-0327-3083.pdf.

**Evaluation of Antimony and Mercury Exposure in Fire Fighters**

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The HHE Program responded to a request to investigate fire fighters' potential exposure to antimony through their station uniform pants made of FireWear® fabric. FireWear® fabric contains antimony trioxide, which is often used for its flame retardant properties. HHE Program investigators reviewed results from hair and urine tests that had been performed by fire fighters' personal physicians prior to the NIOSH investigation and then collected urine samples to measure urine antimony and mercury levels. Investigators also administered a questionnaire asking about personal characteristics and work history. Investigators found that firefighters who had worn pants made from FireWear® fabric had urine antimony levels similar to those who had not worn these pants; both groups had urine mercury levels below or within the expected range for the general population. HHE Program investigators found that wearing pants made from FireWear® fabric did not pose a health hazard from antimony exposure. HHE Program investigators recommended that station uniforms that comply with the National Fire Protection Association 1975 standard continue to be issued and worn at fire stations and also recommended that garment label instructions be followed when washing station uniforms. The final report is available at: http://www.cdc.gov/niosh/hhe/reports/pdfs/2009-0025-0076-3085.pdf.

**Environmental and Biological Assessment of Environmental Tobacco Smoke Exposure Among Casino Dealers**

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*Kenneth Mead, PhD, PE*

The HHE Program responded to requests to investigate casino dealers' exposure to environmental tobacco smoke (ETS) in three workplaces. HHE Program investigators surveyed casino employees about their work and health symptoms related to ETS exposure. Investigators collected area and personal breathing zone air samples to measure ETS levels and collected urine samples from employees to determine if components of ETS were being absorbed into dealers' bodies. HHE Program investigators found ETS components, including nicotine, 4-vinyl pyridine, respirable dust, solanesol, toluene, benzene, naphthalene, formaldehyde, acetaldehyde, and p-dichloromehtane in the air. Investigators also found increased urinary levels of one ETS biomarker, 4-(Methylnitrosamino)-1-(3-pyridyl)-1-butanol (NNAL), during the work shift, which demonstrated that casino dealers were exposed to a known carcinogen from tobacco smoke. Casino dealers reported a higher prevalence of respiratory symptoms compared to administrative and engineering employees at the casinos. HHE Program investigators recommended that smoking be banned in the casinos and that casino managers ensure that ventilation systems are working properly. The final report is available at: http://www.cdc.gov/niosh/hhe/reports/pdfs/2005-0201-3080.pdf.