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Health Alert

Hurricane Sandy advisory to employers and workers

The flooding that followed Hurricane Sandy has scattered hazardous chemicals, toxic materials and raw, untreated sewage across coastal areas of New York and New Jersey. Floodwater should be considered contaminated unless tested and proven otherwise. To protect against these hazards, the Irving J. Selikoff Center of Excellence in Occupational Medicine at Mount Sinai School of Medicine offers the following guidance. This advisory is intended for workers who may have incidental exposure to hazardous conditions resulting from Hurricane Sandy. Workers who are involved in clean-up operations should have training and may need additional protection.

Hazard: Water-borne Disease

Outbreaks of diarrhea and respiratory illness can result from contact with raw sewage, which may contain disease-causing bacteria, viruses and parasites. Diseases that have been associated with flood waters include paratyphoid fever, cholera, hepatitis E, leptospirosis (from rodent urine), and diseases caused by E. Coli and C. parvum, among others. Most diseases from flood waters are spread by ingesting the organisms. Most waterborne diseases are spread by swallowing contaminated water. In some cases, microbes enter the body by puncture wounds or through abraded skin or mucous membranes. Flood water should be considered contaminated, unless tested and proven otherwise.

Hazard: Toxic Chemicals in Floodwaters

Flood waters may contain toxic chemicals from industrial, institutional and residential sites, including lead paint, fuel and pesticides. Floodwaters may generate toxic gases and vapors from the evaporation of solvents and from the decomposition of sewage and other organic debris, such as leaves and garbage. The drying out of floodwaters and the clean-up of debris can release hazardous dust into the air, such as asbestos, silica, lead, gypsum, fiberglass and mold. The residue and sediment, that are left behind after floodwaters have evaporated, will contain many of the toxic chemicals that were present in the water.

Floodwaters near Superfund sites such as Newtown Creek and the Gowanus Canal may contain: lead and other heavy metals, polycyclic aromatic hydrocarbons (PAH's), Volatile Organic Contaminants (VOC's), pesticide residues and PCB's.

Clean-up of contamination from floodwaters can pose a hazard if harsh chemicals or disinfectants are used, especially in poorly ventilated areas. These chemicals may cause irritation and allergic-like reactions.

Hazard: Carbon Monoxide and Combustion Products

Beware of confined spaces with poor ventilation. CO is colorless, odorless and highly deadly gas. Deadly carbon monoxide gas can accumulate in these spaces, especially if there is a source of combustion such as a generator, propane heater or charcoal grill. As of November 6, 2012, CDC reports 263 cases of carbon monoxide (CO) poisoning and 4 deaths in the wake of Hurricane Sandy. The effects of CO poisoning range from fatigue and headache to cardiorespiratory failure, coma, and death.

Other hazardous combustion products can be released by fossil fuel burning, fires, and the intentional burning of debris. These include irritating gases; cancer causing substances such as formaldehyde, PAHs and dioxin; and very fine, possibly invisible, particles of soot which may cause lung and heart problems

Hazard: Mold and Bacteria

Materials that have been saturated with water become breeding grounds for mold and bacteria. Although mold and bacteria are already in the air, levels can increase from active sources. Mold can cause or aggravate respiratory symptoms, including those from allergies and asthma.

Hazard: Stress

Workers, who have lost loved ones, lost their homes, witnessed or narrowly escaped tragedy and destruction, worked excessive hours of overtime, or whose lives have been seriously disrupted in other ways by the storm, may be at risk of stress and mental illness.

Hazard: Strains and sprains

One of the most common health effects of debris removal and clean-up efforts is musculoskeletal injuries from heavy lifting, repetitive motions and awkward postures.

Recommendations

- Only trained hazardous waste workers who have proper safety equipment should attempt to clean up toxic chemicals, other hazardous waste, contaminated sediments or large amounts of mold.
- If you develop dizziness, extreme fatigue, headache, a high fever, nausea, vomiting, diarrhea, jaundice or flu-like symptoms after contact with floodwater, sediments, or combustion products, seek medical attention immediately.
- Human contact with contaminated water should be avoided.
- Workers with the potential for puncture wounds should be up to date on their tetanus vaccine.
- Ventilation is a key to reducing exposure to chemical vapors, gases and aerosols from floodwaters, combustion, fire, and debris removal. Never work in an unventilated enclosed space, such as a garage, trench, manhole, or unventilated basement if there is a possibility of contaminant generation. Ventilate the space by pumping in uncontaminated air and allowing the contaminated air to escape.

Check air levels before entry for expected hazards, depending on the situation. These may include oxygen deficiency, carbon monoxide, explosive atmospheres, hydrogen sulfide or other contaminants. When working outdoors, work upwind of smoke and dust, if possible.

- If there is a possibility of splashes, avoid getting floodwater in your mouth, eyes and nose by covering your face with a face shield or with a mask and goggles.
- Wear protective clothing such as chemically resistant gloves, boots and clothes if you cannot avoid exposure. If skin comes into contact with flood water, wash thoroughly with soap and water. Although respirators may be needed in some circumstances, they are not recommended unless accompanied by careful selection, medical clearance, fit testing and training.
- Cover any open cuts or sores that could be exposed to floodwater. If they get wet, clean them by washing them with soap and applying an antibiotic ointment to discourage infection.
- If clothes come into contact with flood water, wash them in water and detergent separately from uncontaminated clothes and linens. Avoid bringing these clothes or shoes to your home if possible.
- Local authorities will tell you if tap water is safe to drink or to use for cooking or bathing. If the water is not safe to use or if you are not sure whether it is safe or not, follow local instructions to use bottled water or to boil or disinfect water for cooking, cleaning, or bathing.
- Beware of trying to move upended propane tanks. They may be damaged and leaking – a spark could cause a dangerous fire or explosion. Call your local police or fire department to move or remove them.
- When removing batteries from flooded cars, use insulated gloves since these may still contain an electrical charge. Avoid coming into contact with acids that may still be contained in and around the battery.
- Workers suffering from stress should be given the opportunity to seek professional assistance to deal with the crisis.
- Use mechanical equipment to lift heavy objects. When this is not possible, use extra people. For repetitive lifting, keep loads to below 30-50 pounds per person (the lower number is for more awkward loads).
- Avoid the overuse of disinfectants. Use mild detergent and water for clean-up of hard surfaces, unless a public health agency or professional advises the use of disinfectants. Porous materials may have to be cleaned separately or discarded. If disinfectants are applied they should be done strictly according to directions on the product label and in well ventilated areas.

Besides the hazards described above, other concerns include excessive exposure to cold weather, fire and explosion hazards, electrocution, falls, and the dangers of unstable structures.

For more information on these topics, as well as more detail on the hazards mentioned in this fact sheet, see:

Resources

Occupational Safety and Health Administration:

www.osha.gov/sandy/index.html

National Institute for Occupational Safety and Health:

www.cdc.gov/niosh/topics/emres/flood.html

New York Committee for Occupational Health and Safety:

www.nycosh.org/index.php?page=hurricane-sandy

For questions or to make an appointment please contact the Mount Sinai Selikoff Center at (212) 241-5555.