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Army Industrial Hygiene News and Regulatory Summary

Hazardous Substances

One-Fifth of Chronic Lung Disease in Construction Workers Linked to Asbestos, Silica and Other on-the-Job Exposures

A recent study by the Center for Construction Research and Training and Duke University found that 18 percent of Chronic Obstructive Pulmonary Disease among construction workers is caused by on-the-job exposure to vapors, gases, dusts, and fumes such as asbestos, silica dusts, and welding fumes*.

The disease progressively diminishes a person's ability to breathe and is characterized by mucous-producing cough, shortness of breath, and chest tightness. It afflicts more than 13 million people in the U.S., and construction workers are at an increased risk.



Researchers compared the work history, smoking habits, and medical screening results of roughly 2,000 older construction workers with and without COPD between 1997 and 2013. Their findings indicate that, while smoking remains the main cause of COPD, workplace exposure to these hazards pose a more significant risk than previously thought and employers should take appropriate actions to protect workers.

Read more:

<https://www.osha.gov/as/opa/quicktakes/qt091515.html#top>

Distribution Statement A - Approved for public release; distribution unlimited.

Special Interest Articles:

- [Nuclear Basics](#)
- [Microbial Cloud](#)
- [Deskercise](#)
- [Male Breast Cancer](#)
- [Training Schedule](#)

DOEHRS Super Star

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Comparison of a Wipe Method With and Without a Rinse to Recover Wall Losses in Closed Face 37-mm Cassettes used for Sampling Lead Dust Particulates

Closed-face 37-mm polystyrene cassettes are often used for exposure monitoring of metal particulates. Several methods have been proposed to account for the wall loss in air sampling cassettes, including rinsing, wiping, within-cassette dissolution, and an internal capsule fused to the filter that could be digested with the filter. Until internal capsules replace filters, other methods for assessing wall losses may be considered. To determine if rinsing and wiping or wiping alone is adequate to determine wall losses on cassettes, we collected 54 full-shift area air samples at a battery recycling facility. We collected six replicate samples at three locations within the facility for three consecutive days. The wall losses of three replicate cassettes from each day-location were analyzed following a rinse and two consecutive wipes. The wall losses of the other three replicates from each day-location were analyzed following two consecutive wipes only. Mixed-cellulose ester membrane filter,

rinse, and wipes were analyzed separately following NIOSH Method 7303. We found an average of 29% (range: 8–54%) recovered lead from the cassette walls for all samples. We also found that rinsing prior to wiping the interior cassette walls did not substantially improve recovery of wall losses compared to wiping alone. A rinse plus one wipe recovered on average 23% (range: 13–33%) of the lead, while one wipe alone recovered on average 21% (range: 16–22%). Similarly, we determined that a second wipe did not provide substantial additional recovery of lead (average: 4%, range: 0.4–19%) compared to the first wipe disregarding the rinse (average: 18%, range: 4–39%). We concluded that when an internal capsule is not used, wall losses of lead dust in air sampling cassettes can be adequately recovered by wiping the internal wall surfaces of the cassette with a single wipe.

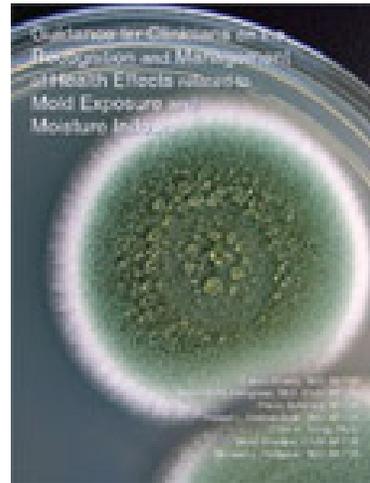
Read more: Journal of Occupational and Environmental Hygiene Volume 12, Issue 10,



Pittsburgh Hospital Tries to Locate Mold Source after Three Patients Have Died

A hospital in Pittsburgh is working fast to identify the source of a mold that may have killed three of its transplant patients.

The University of Pittsburgh Medical Center (UPMC) first suspected the link between the molds and the deaths during the early days of September when they discovered the mold proliferation in one of its intensive care units for cardiothoracic patients in Presbyterian. So far, two patients have already died in the same hospital room where the molds have been found, although these patients stayed at different periods. Another patient who didn't stay in the unit but in the other campus of the hospital called Montefiore also died in what could be a "fungal infection."



Read more:

<http://www.youthhealthmag.com/articles/23715/20150921/mold-upmc.htm>

Health Care Workers' Knowledge, Perceptions, and Behaviors Regarding Antineoplastic Drugs: Survey from British Columbia, Canada



Although nurses are knowledgeable regarding the risk of exposure to antineoplastic drugs, they often do not adhere with safe work practices. However, the knowledge, perceptions, and behavior of other health care job categories at risk of exposure has yet to be determined. This study aimed to survey a range of health care workers from British Columbia, Canada about their knowledge, perceptions, and

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behaviors regarding antineoplastic drugs. A self-administered questionnaire was sent to participants querying the degree of contact with antineoplastics, knowledge of risks associated with antineoplastics, perceptions of personal risk, previous training with

respect to antineoplastics, and safe work practices.

Read more: Journal of Occupational and Environmental Hygiene Volume 12, Issue 10, 2015 (Available with AIHA membership)

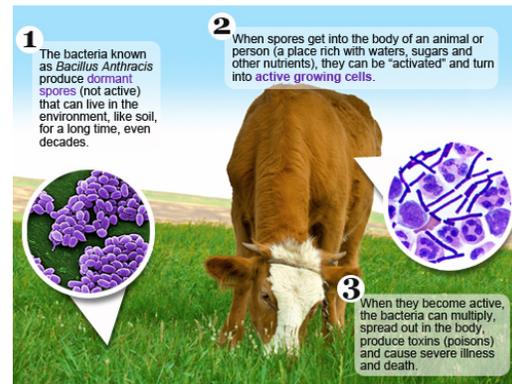
Study Says Anthrax Spores Stay Viable in Topsoil for Weeks

Anthrax spores on some outdoor surfaces initially decay rapidly then slowly, but those on topsoil showed minimal loss of viability weeks later, with or without ultraviolet (UV) light exposure, according to a study yesterday in PLoS One.

US researchers inoculated *Bacillus anthracis* and *B subtilis* spores on glass, wood, concrete, and topsoil with and without exposure to simulated sunlight via UV radiation. They recovered spores after 2, 14, 28, and 56 days.

Read more:

<http://www.cidrap.umn.edu/news->



[perspective/2015/09/news-scan-sep-16-2015](http://www.cidrap.umn.edu/news-scan-sep-16-2015) (scroll down to 3rd article)

Hand Self-Wiping Protocol for the Investigation of Lead Exposure in the Workplace



The purpose of this project was to develop and validate a hand wiping protocol to be used by occupational hygienists, scientists, or other competent persons, measuring skin exposure to lead in workplaces. Inadvertent lead ingestion is likely to occur once the hands of employees have become contaminated. Ideally, a hand wiping protocol should maximize the recovery of

lead-based residues present on employees' hands in a cost-effective and reproducible manner. This article describes an effective and practical hand wiping procedure.

Here, two standardized protocols (A and B) are designed. Protocol A is a self-wiping protocol requiring employees to wipe their own hands using four separate and successive wipes. Protocol B involves a scientist wiping the hands of employees using four wipes, followed by employees self-wiping their hands using two wipes (total of six wipes). Both protocols are defined by four wipe passes over each hand using Ghost wipes.

Because this study took place in the workplace rather than in a simulated laboratory environment, only the relative (i.e., not absolute) removal efficiencies of the hand wiping protocols have been assessed.

The two protocols were first evaluated at a double glazing panel manufacturing site

where between 248 μg and 4544 μg of lead was found on employees' hands. A statistical analysis (t-test) on the mean relative lead levels recovered in the first parts of the protocols indicated that Protocol A was more efficient than Protocol B (73% for Protocol A vs. 65% for Protocol B). The relative recovery of the combined first two passes against the combined first three passes also confirmed the greater efficiency of Protocol A (83.3% for Protocol A vs. 76.5% for Protocol B). However, lead levels recovered on the fourth pass remain significant at more than 10% of the total recovered loadings. Nonetheless, Protocol A was preferred and further evaluated at a lead battery manufacturing site where between 149 μg and 18,784 μg of lead was found on employees' hands.

Read more: Journal of Occupational and Environmental Hygiene Volume 12, Issue 10, 2015 (Available with AIHA membership)

Report Examines Exposure to Isocyanate Paint in Motor Vehicle Repair Workers

Researchers from the U.K.'s Health and Safety Executive (HSE) recently addressed the "common poor workplace practice" within the motor vehicle repair trade of isocyanate paint sprayers lifting up their air-fed visors (AFV) immediately after spraying to check the quality of the paint finish. HSE researchers performed a series of tests to determine the potential increase in exposure during this practice and to learn



whether any degree of residual protection remains when workers lift their visors. The tests, which were conducted using both a breathing simulator and test subjects, showed an approximate 15-fold increase in exposure when a visor is lifted in a contaminated environment. Researchers related the increase in exposure to the assigned protection factor of 40 for an air-fed visor when used correctly.

Read more:

<https://www.aiha.org/publications-and-resources/TheSynergist/Industry%20News/Pages/Report-Examines-Exposure-to-Isocyanate-Paint-in-Motor-Vehicle-Repair-Workers.aspx>

Statistical Modeling of Occupational Exposure to Polycyclic Aromatic Hydrocarbons Using OSHA Data



Polycyclic aromatic hydrocarbons (PAHs) are a group of pollutants with multiple variants classified as carcinogenic. The Occupational Safety and Health Administration (OSHA) provided access to two PAH exposure databanks of United States workplace compliance testing data collected between 1979 and 2010. Mixed-effects logistic models were used to predict the exceedance fraction (EF), i.e., the probability of exceeding OSHA's Permissible Exposure Limit (PEL = 0.2 mg/m³) for PAHs

based on industry and occupation. Measurements of coal tar pitch volatiles were used as a surrogate for PAHs. Time, databank, occupation, and industry were included as fixed-effects while an identifier for the compliance inspection number was included as a random effect. Analyses involved 2,509 full-shift personal measurements. Results showed that the majority of industries had an estimated EF < 0.5, although several industries, including Standardized Industry Classification codes 1623 (Water, Sewer, Pipeline, and Communication and Powerline Construction), 1711 (Plumbing, Heating, and Air-Conditioning), 2824 (Manmade Organic Fibres), 3496 (Misc. Fabricated Wire products), and 5812 (Eating Places), and Major group's 13 (Oil and Gas Extraction) and 30 (Rubber and Miscellaneous Plastic Products), were estimated to have more than an 80% likelihood of exceeding the PEL.

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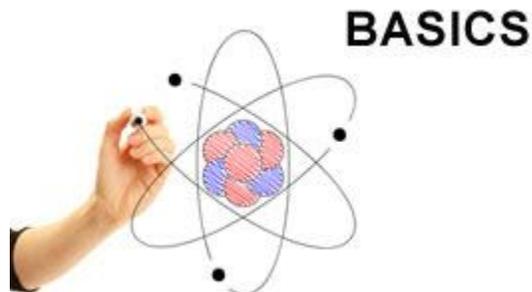
Read more: *Journal of Occupational and Environmental Hygiene* Volume 12, Issue 10,

2015 (Available with AIHA membership)

Radiation

New NTI Tutorial Goes Back to Nuclear Basics

The Nuclear Threat Initiative (NTI), in partnership with the James Martin Center for Nonproliferation Studies (CNS), released a new Nuclear 101 online tutorial that answers basic questions about nuclear materials, reactors and weapons. The mobile-friendly resource uses interactive tools to help students, professionals and the news media understand why nuclear materials are unique and how they can be used to generate power—and peril.



Read more:

<http://www.nti.org/newsroom/news/new-nti-tutorial-goes-back-nuclear-basics/>

Radioactive Contaminants Found In Coal Ash from All Three Major U.S. Coal-Producing Basins



A new study has revealed the presence of radioactive contaminants in coal ash from all three major U.S. coal-producing basins. The study found that levels of radioactivity in the ash were up to five times higher than in normal soil, and up to ten times higher than in the parent coal itself because of the

way combustion concentrates radioactivity. The finding raises concerns about the environmental and human health risks posed by coal ash, which is currently unregulated and is stored in coal-fired power plants' holding ponds and landfills nationwide.

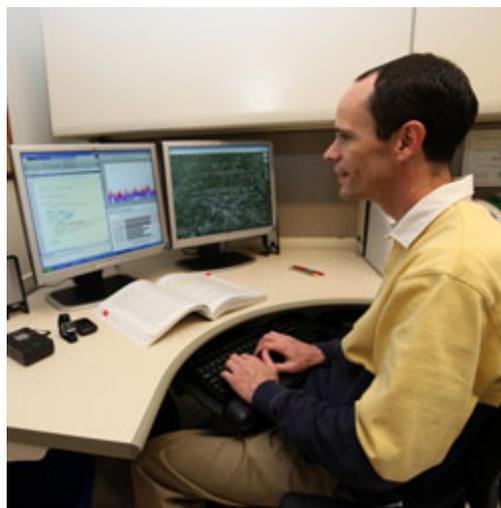
Read more:

<http://www.homelandsecuritynewswire.com/dr20150903-radioactive-contaminants-found-in-coal-ash-from-all-three-major-u-s-coalproducing-basins>

Ventilation

Experimental Measurements of Near-Source Exposure Modeling Parameters

Air concentrations near pollutant sources can be modeled using two-zone and turbulent diffusion models. Each type of model requires a specific pollutant transport parameter: the interzonal air flow (β) is used in the two-zone model and the turbulent diffusion coefficient (DT) in the diffusion model. In this study β and DT were determined experimentally by using concentrations measured around the release of a tracer vapor. A robot arm provided motion in the space near the source to simulate worker actions. Eighty-two experiments were conducted at two room locations and with different robot arm motion programs. β and DT for were calculated using room geometry, ventilation parameters and the measured concentrations during the experiments. The near zone geometry was a 0.4 m hemisphere. The presence of motion in the vicinity of the source was important for the appropriate application of both models. The values of β were log-normally distributed with a mean of 2.03 m³/min, a geometric mean (GM) of 1.65 m³/min (1.42–1.93 95% C.I.) and a geometric standard deviation of 1.82. DT was also log-normally distributed with a mean of 0.586 m²/min, a GM of 0.545 m²/min (0.493–0.600 95% C.I.) and



GSD of 1.45. The location within the room had an influence on the value of both β and DT. The use of random airspeed and the free surface area around the source was confirmed as an appropriate method for determining β . A recently developed algorithm was supported as useful for determination of DT. The results strengthen the application of both the two-zone and turbulent diffusion models for worker exposure modeling.

Read more: Journal of Occupational and Environmental Hygiene Volume 12, Issue 10, 2015 (Available with AIHA membership)

NIOSH to Manufacturer: Improve Ventilation, Metalworking Fluid Maintenance



During a Health Hazard Evaluation at an aircraft ejection seat manufacturer, NIOSH staff found a methoxypyrazine, a chemical that can be produced by bacteria, to be the likely cause of a lingering unpleasant odor. Investigators found 2-methoxy-3,5-dimethylpyrazine (3,5-MDMP) in the air and

in the metalworking fluid at the facility. Their analysis of air and bulk metalworking fluid samples identified bacteria belonging to the same order that produce 3,5-MDMP. According to the NIOSH report, the same bacteria may be contributing to the high concentrations of endotoxin that were also found in the metalworking fluid.

Read more:

<https://www.aiha.org/publications-and-resources/TheSynergist/Industry%20News/Pages/NIOSH-to-Manufacturer-Improve-Ventilation,-Metalworking-Fluid-Maintenance-.aspx>

PPE

Baby's on the Way—What About Your Respirator?

Pregnant women may turn to maternity clothes for comfort but may wonder whether they need a new respirator in the workplace. Will their fit-tested facemasks still provide a tight seal if they gain weight during pregnancy? Results of a new NIOSH study, accepted for publication by the *Journal of Occupational and Environmental Hygiene*, suggest that the fit-tested model of respirator provided before pregnancy will continue to fit a pregnant worker as long as she follows medical guidelines for healthy



weight gain during pregnancy. A larger study is warranted to validate the findings, the researchers said.

Read more:

<http://www.cdc.gov/niosh/research-rounds/ResRoundsV1n2.html#c>

Penetration of Combustion Aerosol Particles through Filters of NIOSH-Certified Filtering Facepiece Respirators (FFRs)

Filtering facepiece respirators (FFRs) are commonly worn by first responders, first receivers, and other exposed groups to protect against exposure to airborne particles, including those originated by combustion. Most of these FFRs are NIOSH-certified (e.g., N95-type) based on the performance testing of their filters against charge-equilibrated aerosol challenges, e.g., NaCl. However, it has not been examined if the filtration data obtained with the NaCl-challenged FFR filters adequately represent the protection against real aerosol hazards such as combustion particles. A filter sample of N95 FFR mounted on a specially designed holder was challenged with NaCl particles and three combustion aerosols generated in a test chamber by burning wood, paper, and plastic. The concentrations upstream (C_{up}) and downstream (C_{down}) of the filter were measured with a TSI P-Trak condensation particle counter and a Grimm Nanocheck particle spectrometer. Penetration was determined as (C_{down}/C_{up}) × 100%. Four

test conditions were chosen to represent inhalation flows of 15, 30, 55, and 85 L/min. Results showed that the penetration



values of combustion particles were significantly higher than those of the "model" NaCl particles ($p < 0.05$), raising a concern about applicability of the N95 filters performance obtained with the NaCl aerosol challenge to protection against combustion particles.

Read more: Journal of Occupational and Environmental Hygiene Volume 12, Issue 10, 2015 (Available with AIHA membership)

Noise

Patrol Officer Daily Noise Exposure



Previous research shows that police officers are at a higher risk for noise induced hearing loss (NIHL). Little data exists on the occupational tasks, outside of the firing range, that might lead to the increased risk of NIHL. The current study collected noise dosimetry from patrol officers in a smaller department and a larger department in southern Wisconsin, United States. The noise dosimeters simultaneously measured noise in three virtual dosimeters that had different thresholds, criterion levels, and exchange rates. The virtual dosimeters were set to: the Occupational Safety and Health Administration (OSHA) hearing conservation criteria (OSHA-HC), the OSHA permissible exposure level criteria (OSHA-PEL), and the American Conference of Governmental Industrial Hygienists (ACGIH). In addition to wearing a noise dosimeter during their respective work days, officers completed a log form documenting the type of task performed, the duration of that task,

if the task involved the use of a siren, and officer characteristics that may have influenced their noise exposure, such as the type of dispatch radio unit worn. Analysis revealed that the normalized 8-hour time weighted averages (TWA) for all officers fell below the recommended OSHA and ACGIH exposure limits. The tasks involving the use of the siren had significantly higher levels than the tasks without ($p = 0.005$). The highest noise exposure levels were encountered when patrol officers were assisting other public safety agencies such as a fire department or emergency medical services (79 dBA). Canine officers had higher normalized 8-hr TWA noise exposure than regular patrol officers ($p = 0.002$). Officers with an evening work schedule had significantly higher noise exposure than the officers with a day or night work schedule ($p = 0.023$). There were no significant differences in exposure levels between the two departments ($p = 0.22$). Results suggest that this study population is unlikely to experience NIHL as established by the OSHA or ACGIH occupational exposure levels from the daily occupational tasks that were monitored.

Read more: Journal of Occupational and Environmental Hygiene Volume 12, Issue 10, 2015 (Available with AIHA membership).

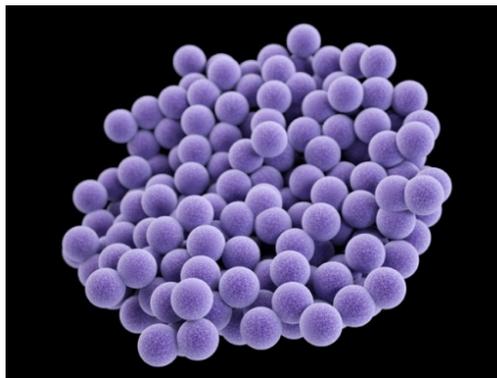
Preventive Medicine

People Emit a Unique "Microbial Cloud" of Bacteria, Study Finds

Every person emits a unique blend of microbes into the air, and this "microbial cloud" is personalized enough that it could be used to identify people, a new study finds.

The results "demonstrate for the first time that individuals release their own personalized microbial cloud," James Meadow, the lead author of the study, said in a statement.

Trillions of bacteria live on and in the human body. Together, these bacteria make up what researchers call the human microbiome.



Read more:

<http://www.cbsnews.com/news/people-emit-a-unique-microbial-cloud-of-bacteria-study-finds/>

US Surgeon General Launches Campaign with National Call to Action on Walking



The United States Surgeon General today issued a call to action to address major public health challenges such as heart

disease and diabetes. Step It Up! The Surgeon General's Call to Action to Promote Walking and Walkable Communities articulates the health benefits of walking while addressing the fact that many communities unacceptably lack safe and convenient places for individuals to walk or wheelchair roll.

Read more:

<http://www.hhs.gov/news/press/2015pres/09/20150909a.html>

CDC Funding Helps States Combat Prescription Drug Overdose Epidemic

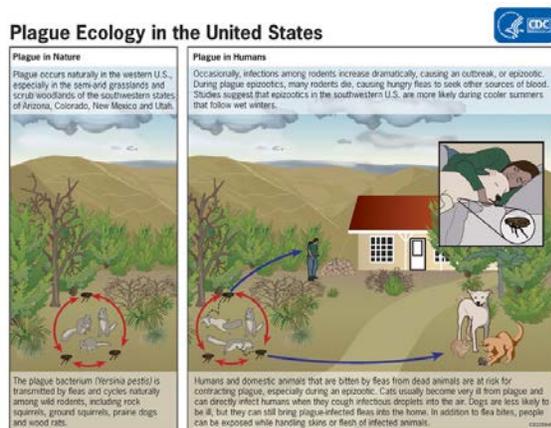
CDC announced the launch of Prescription Drug Overdose: Prevention for States, a new program to help states end the ongoing prescription drug overdose epidemic. The Prevention for States program, as part of the U.S. Department of Health and Human Services' Opioid Initiative, will make a strong investment in 16 states, giving them the resources and expertise they need to help prevent overdose deaths related to prescription opioids. The program builds upon the infrastructure of CDC's Prevention Boost and Core Violence and Injury Prevention programs.



Read more:

<http://www.cdc.gov/media/releases/2015/p0904-cdc-funding.html>

Michigan Woman Contracts First-Ever Midwest Plague Illness



A Michigan woman has contracted bubonic plague while hiking in Colorado, the Denver

Post reported today. The woman, from Marquette County in the state's Upper Peninsula, represents the first case ever confirmed in a Midwest state, officials said.

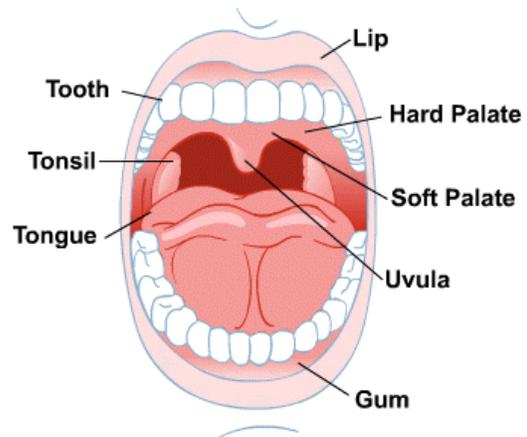
A spokesperson for the Michigan Department of Health and Human Services said the woman has been treated. Health officials said the case poses no threat to the general public, the Detroit Free Press reported yesterday.

Read more:

<http://www.cidrap.umn.edu/news->

The Soft Palate Is an Important Site of Adaptation for Transmissible Influenza Viruses

Influenza A viruses pose a major public health threat by causing seasonal epidemics and sporadic pandemics. Their epidemiological success relies on airborne transmission from person to person; however, the viral properties governing airborne transmission of influenza A viruses are complex. Influenza A virus infection is mediated via binding of the viral haemagglutinin (HA) to terminally attached $\alpha 2,3$ or $\alpha 2,6$ sialic acids on cell surface glycoproteins. Human influenza A viruses preferentially bind $\alpha 2,6$ -linked sialic acids whereas avian influenza A viruses bind $\alpha 2,3$ -linked sialic acids on complex glycans on airway epithelial cells^{1, 2}. Historically, influenza A viruses with preferential association with $\alpha 2,3$ -linked sialic acids have not been transmitted efficiently by the airborne route in ferrets^{3, 4}. Here we observe efficient airborne transmission of a 2009 pandemic H1N1 (H1N1pdm) virus (A/California/07/2009) engineered to preferentially bind $\alpha 2,3$ -linked sialic acids. Airborne transmission was associated with rapid selection of virus with a change at a single HA site that conferred binding to long-chain $\alpha 2,6$ -linked sialic acids, without loss of $\alpha 2,3$ -linked sialic acid binding. The transmissible virus emerged in experimentally infected ferrets within 24 hours after infection and was remarkably enriched in the soft palate, where long-



chain $\alpha 2,6$ -linked sialic acids predominate on the nasopharyngeal surface. Notably, presence of long-chain $\alpha 2,6$ -linked sialic acids is conserved in ferret, pig and human soft palate. Using a loss-of-function approach with this one virus, we demonstrate that the ferret soft palate, a tissue not normally sampled in animal models of influenza, rapidly selects for transmissible influenza A viruses with human receptor ($\alpha 2,6$ -linked sialic acids) preference.

Read more:

<http://www.nature.com/nature/journal/vaop/ncurrent/full/nature15379.html>

Environmental Health

Americans Throwing Out Twice as Much Trash as Thought



Americans are sending more than twice as much trash to landfills as the federal

government has estimated, according to a new study.

It turns out that on average America tosses five pounds of trash per person per day into its landfills, according to an analysis of figures from the same study, which is based on actual landfill measurements instead of government estimates.

Read more:

<http://www.cbsnews.com/news/americans-throwing-out-twice-as-much-trash-as-thought/>

Ethical Issues in Environmental Health Research Related to Public Health Emergencies: Reflections on the GuLF STUDY

Health research in the context of an environmental disaster with implications for public health raises challenging ethical issues. This article explores ethical issues that arose in the Gulf Long-term Follow-up Study (GuLF STUDY) and provides guidance for future research. Ethical issues encountered by GuLF STUDY investigators included a) minimizing risks and promoting benefits to participants, b) obtaining valid informed consent, c) providing financial compensation to participants, d) working with vulnerable participants, e) protecting participant confidentiality, f) addressing



conflicts of interest, g) dealing with legal implications of research, and h) obtaining expeditious review from the institutional review board (IRB), community groups, and

other committees. To ensure that ethical issues are handled properly, it is important for investigators to work closely with IRBs during the development and implementation of research and to consult with groups representing the community. Researchers should consider developing protocols, consent forms, survey instruments, and other documents prior to the advent of a public health emergency to

allow for adequate and timely review by constituents. When an emergency arises, these materials can be quickly modified to take into account unique circumstances and implementation details.

Read more:

<http://ehp.niehs.nih.gov/1509889/>

Pollution Prevention Week: Tips to Living Greener



The third week in September annually is celebrated by the U.S. EPA as Pollution Prevention Week, paying homage to the anniversary of the Pollution Prevention Act, which passed 25 years ago and established

a national policy to prevent or reduce pollution.

Read more

<http://ehstoday.com/environment/pollution-prevention-week-tips-living-greener>

Air Pollution and Birth Weight: New Clues about a Potential Critical Window of Exposure

Researchers have previously reported associations between exposure to air pollution during pregnancy and decreased birth weights.^{1,2} However, in any given location there is usually very little variation in air pollutant concentrations over short time periods, barring events such as wildfires and other seasonally influenced sources of pollution. It has therefore been difficult to pinpoint a particular window of time during gestation when an exposed fetus might be particularly susceptible to air



pollutants.³ In this issue of EHP, investigators report findings on birth weight

arising from a unique research opportunity: the temporary decline in air pollution during the 47 days comprising the 2008 Beijing Summer Olympic Games and Paralympic Games.³

Read more: <http://ehp.niehs.nih.gov/123-A242/>

Going Deep: Cautious Steps toward Seabed Mining



The deep ocean was once assumed to be lifeless and barren. Today we know that even the deepest waters teem with living creatures, some of them thought to be little changed from when life itself first appeared on the planet. The deep ocean is also essential to the earth's biosphere—it regulates global temperatures, stores carbon, provides habitat for countless species, and cycles nutrients for marine food webs.¹

Currently stressed by pollution, industrial fishing, and oil and gas development, these cold, dark waters now face another challenge: mining. With land-based mineral sources in decline, seabeds offer a new and largely untapped frontier for mineral extraction, and companies are gearing up to mine a treasure trove of copper, zinc, gold, manganese, and other minerals from the ocean floor.^{2,3}

Scientists, regulators, and mining companies are now collaborating on frameworks and strategies for mining the seabed responsibly. Cindy Van Dover, director of the Duke University Marine Laboratory and chair of the school's Division of Marine Science and Conservation, says that's encouraging, given that seabed mining appears to be inevitable.

Read more: <http://ehp.niehs.nih.gov/123-A234/>

Ergonomics

An Evaluation of the Physiological Strain Experienced by Electrical Utility Workers in North America



The purpose of this study was to assess the physiological strain experienced by North American electrical utility workers during the performance of their normal work duties in heat stressed conditions. Three common job categories were monitored as they are normally performed in 32 electrical utility workers: (i) Ground Work (n = 11); (ii) Bucket Work (n = 9); and (iii) Manual Pole Work (n = 12). Worker hydration status (urine specific gravity (USG)) was measured prior to and following the work monitoring period (duration: 187 ± 104 min). Core and skin temperatures as well as heart rate were measured continuously. Physiological Strain Index (PSI) was calculated from the measurements of core temperature and heart rate. Prior to the start of the work shift, 38% of workers were euhydrated (USG < 1.020; n = 12) whereas the majority of workers were dehydrated (USG > 1.020;

prevalence: 75%; $p < 0.01$) following work. The overall mean and peak core temperatures for all monitored workers were $37.9 \pm 0.3^\circ\text{C}$ and $38.3 \pm 0.5^\circ\text{C}$, respectively. When responses were compared between job categories, greater mean and peak increases in core temperature were observed in Manual Pole Work relative to the other job categories (both $p < 0.04$). In fact, six workers performing Manual Pole Work achieved core temperatures in excess of 38.5°C , while only one other worker surpassed this threshold in Bucket Work. The high levels of thermal strain were paralleled by elevated mean and peak heart rate and PSI responses, which were greater in Manual Pole Work in comparison to the other job categories (all $p \leq 0.05$). Furthermore, two workers performing Manual Pole Work achieved severely elevated core temperatures reaching or exceeding 39.5°C along with prolonged periods of near maximal heart rate responses (i.e., >90% of heart rate reserve). We report elevated levels of thermal and cardiovascular strain in electrical utility workers during work in the heat and potentially dangerous levels of hyperthermia during particularly strenuous work.

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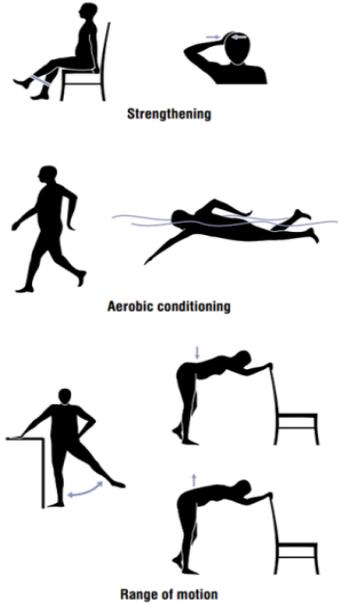
Read more: *Journal of Occupational and Environmental Hygiene* Volume 12, Issue 10, 2015 (Available with AIHA membership)

10 Deskercises You Can Do at Work

A spate of new research has found that prolonged sitting—like the kind you do all day at work—is sabotaging your health and turning you into a 9-to-5 couch potato. One study last year found that sitting can increase your risk for cancer by more than 60%.

Read more:

<http://time.com/4019563/exercise-work-desk/?xid=homepage#4019563/exercise-work-desk/?xid=homepage>



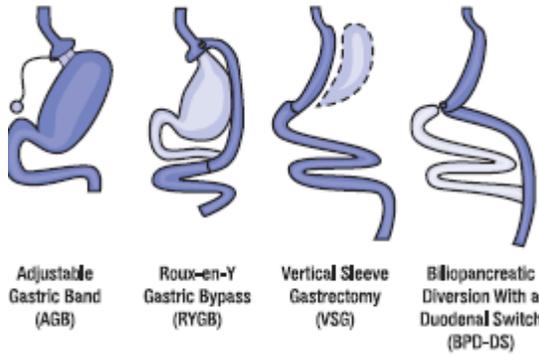
Safety

Elective Surgeries, Hidden Responsibilities and Safety Program Management

An unforeseen risk factor for injury was brought to light recently in Ohio, where two employees in a span of two weeks fell while at work and broke a bone. One employee, a nurse, was hospitalized and required surgery to repair her fractured hip.

Immersed in the process of seeking to reduce hazards in the workplace, a staff development coordinator, who also was the safety specialist, reported what seemed to an unrelated commonality: Both injured employees had undergone gastric bypass procedures. Could the surgery and its

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aftereffects link these two OSHA recordable injuries?

Read more:

<http://ehstoday.com/safety/elective-surgeries-hidden-responsibilities-and-safety-program-management>

Study by New Hampshire Surveillance Program on Injuries and Underreporting

A recent study by the New Hampshire Occupational Health Surveillance Program of the New Hampshire Division of Public Health Services focused on injury underreporting and the role of workers' compensation in paying for the treatment of work-related injuries. The study focused on survey respondents who were working for wages when they had been injured at work seriously enough to require medical attention. Nearly half of these survey respondents used workers' compensation to pay for their injury. Other payer sources included personal insurance plans, Medicare and Medicaid combined, and those only partially paid for by workers' compensation. The report can be found at <http://www.dhhs.nh.gov/DPHS/hsdm/ohs/>



[documents/brfss-wri-underreporting-2015.pdf](https://www.dhhs.nh.gov/DPHS/hsdm/ohs/documents/brfss-wri-underreporting-2015.pdf)

Read more:

<http://www.cdc.gov/niosh/enevents/enevsw13n4.html#nora>

Bad News from BLS: Several Industries Experiencing Higher Rates of Occupational Fatalities

Mining, construction, manufacturing, law enforcement and agriculture experience significant increases in fatal injuries in 2014,

and the news isn't great for older workers, either.

A preliminary total of 4,679 fatal work injuries were recorded in the United States in 2014, an increase of two percent over the revised count of 4,585 fatal work injuries in 2013, according to results from the Census of Fatal Occupational Injuries (CFOI) conducted by the U.S. Bureau of Labor Statistics (BLS). Three industries/occupations – mining (17 percent), law enforcement (17 percent) and agriculture (14 percent) – experienced

double-digit increases, while manufacturing deaths were up by nine percent and construction fatalities increased by six percent.

Read more:

<http://ehstoday.com/safety/bad-news-bls-several-industries-experiencing-higher-rates-occupational-fatalities>

PHMSA Final Rule Streamlines and Clarifies HazMat Special Permits and Approvals Application Process



As part of its regulatory review initiative, the U.S. Department of Transportation's Pipeline and Hazardous Materials Safety Administration (PHMSA) announced a final rule that streamlines the hazmat special permits and approvals application process

by incorporating new procedures for evaluating applications into the Hazardous Materials Regulations. In taking this action, PHMSA also fulfills requirements of the Moving Ahead for Progress in the 21st Century Act (P.L. 112-141) by making the application review process more transparent to our stakeholders.

Read more:

<http://phmsa.dot.gov/hazmat/phmsa-final-rule-streamlines-and-clarifies-hazmat-special-permits-and-approvals-application-process>

The FDA Takes Important Steps in Modernizing the Food Safety System

The FDA took one of the most significant steps in decades to prevent foodborne illness by finalizing the first two of seven

major rules under the bipartisan FDA Food Safety Modernization Act (FSMA).



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Today's action is the first step in putting greater emphasis on the prevention of foodborne illness, holding imported food to the same food safety standard as domestically produced food, and developing a nationally integrated food safety system in partnership with state and local authorities.

An estimated 48 million people (1 in 6 Americans) get sick each year from foodborne diseases, according to recent data from the U.S. Centers for Disease Control and Prevention. Approximately 128,000 are hospitalized, and 3,000 die each year. Over the past few years, high-profile outbreaks related to various foods, from spinach to peanut products, have



underscored the need to make continuous improvements in food safety.

Read more:

<http://www.fda.gov/NewsEvents/Newsroom/PressAnnouncements/ucm461437.htm>

'Laboratory Biorisk Management' Details Safety, Security Methods for Biosciences Sites



Recent mishaps at laboratories that mishandled potentially dangerous biological substances and the transmission of the

Ebola virus in a U.S. hospital are symptoms at bioscience facilities that two Sandia National Laboratories researchers think could be prevented by implementing the practices in a new book on biorisk management.

Read more:

https://share.sandia.gov/news/resources/news_releases/biorisk_book/

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Chemical Burn Risk in Car and Truck Washing Highlighted by Washington Researchers

In Washington State, from 2001 through 2013, one worker died and 48 others suffered chemical burns from contact with hydrofluoric-acid-based products used during car and truck washing and auto detailing, researchers reported August 21. Safer alternatives are needed to prevent risks of severe chemical burns and toxicity, said researchers Carolyn K. Reeb-Whitaker, Naomi J. Anderson, and David K. Bonauto, of the Safety and Health Assessment and Research for Prevention Program, Washington State Department of Labor and Industries; and Carly M. Eckert, of the Department of Environmental and



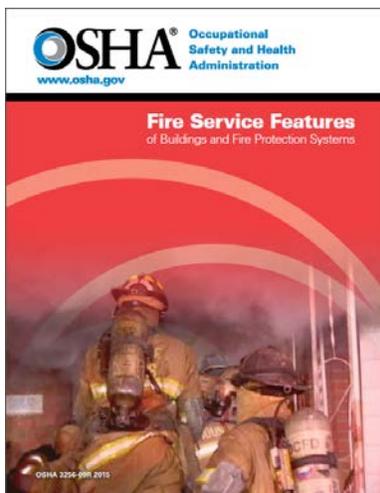
Occupational Health Sciences, University of Washington.

Read more:

<http://www.cdc.gov/niosh/enevents/eneventsv13n5.html#news>

Emergency Preparedness & Response

Revised OSHA Manual Addresses Building Design, Emergency Responder Safety



New content in OSHA's Fire Service Features of Buildings and Fire Protection Systems manual is intended to explain how

firefighters and other emergency responders can resolve incidents sooner and more safely if a building design is tailored to meet their needs. The manual, which was originally published in 2006, provides information about how fire personnel and emergency responders typically interact with building features and fire protection systems during fires and other emergencies. The revised manual includes new chapters on water supply and integrating design elements to protect fire personnel during a building's construction,

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occupancy, and demolition phases; new sections on energy conservation, emergency power, and room and floor numbering; and additional photos to help explain concepts.

Read more:

<https://www.aiha.org/publications-and-resources/TheSynergist/Industry%20News/Pages/Revised-OSHA-Manual-Addresses-Building-Design,-Emergency-Responder-Safety.aspx>

NIOSH Emergency Preparedness and Response



September is National Preparedness Month, reminding us that we need to plan wisely to minimize death, injury, and devastation from large-scale disasters. We have seen this in the wake of the September 11, 2001, terrorist attacks; the flooding of New Orleans and other destruction caused by Hurricane Katrina 10

years ago; and other calamities of the past 15 years. Every disaster or novel disease can put workers at higher risk of injury, illness, or death. An effective response ensures the health and safety of people who work in or near a disaster area, workers who respond to the emergency, and those who work in recovery.

Read more:

<http://www.cdc.gov/niosh/enevs/enevs13n5.html>

Deployment Health

Unique Program Addresses Behavioral and Social Health Issues across the Army

Today's Soldiers are held to high standards, and expected to display the Army values of loyalty, duty, respect, selfless service, honor, integrity and personal courage.

And although military service is still regarded as one of the most highly-

respected professions, one should remember that these Soldiers are still human. Many of the issues that Soldiers face are similar to the ones that are encountered by their civilian counterparts.

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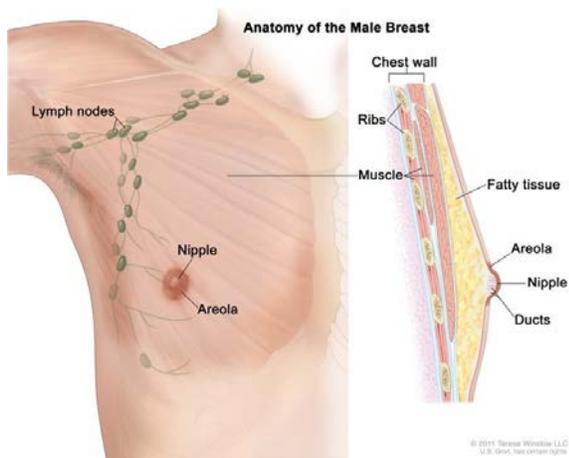
The Army Institute of Public Health's Behavioral and Social Health Outcomes Program, or BSHOP, recognizes this truth.

Read more:

http://www.army.mil/article/152673/Unique_program_addresses_behavioral_and_social_health_issues_across_the_Army/



ATSDR Study Examines Possible Link between Marines' Male Breast Cancer and Exposure to Contaminated Drinking Water at Camp Lejeune



Results from a study conducted by the Agency for Toxic Substances and Disease Registry (ATSDR) suggest that male breast cancer might be associated with being stationed at Camp Lejeune Marine Corps Base in North Carolina and military housing exposure to the volatile organic compounds (VOCs) perchloroethylene (PCE), t-1, 2 dichloroethylene (DCE), and vinyl chloride in

drinking water at the base. However, the findings of this study were based on small numbers of cases, and modeled levels of exposure, so should be interpreted with caution.

According to the study which appears in the journal *Environmental Health*, the risk of male breast cancer increased slightly with being stationed at Camp Lejeune and higher levels of exposure to PCE. The findings also suggested that exposures to trichloroethylene (TCE), PCE, DCE, and vinyl chloride while stationed at the base might have accelerated the onset of male breast cancer.

Read more:

<http://www.atsdr.cdc.gov/news/displaynews.asp?PRid=2602>

New Military Radio Uses Soldiers' Bones to Send Messages

A new radio technology lets warfighters talk to each other by harnessing their bones to transmit and listen to messages.

The technology leverages the human body's natural ability to transmit sound through bone. It takes the bone-transmitted messages and then delivers them directly to the inner ear through the warfighter's helmet.

Warfighters can both listen to messages and send messages this way – and the tech is the mere weight and size of a small coin.



Read more:

<http://www.foxnews.com/tech/2015/09/10/new-military-radio-uses-soldiers-bones-to-send-messages/>

Nanotechnology

A Field Study on the Respiratory Deposition of the Nano-Sized Fraction of Mild and Stainless Steel Welding Fume Metals



A field study was conducted to estimate the amount of Cr, Mn, and Ni deposited in the respiratory system of 44 welders in two

facilities. Each worker wore a nanoparticle respiratory deposition (NRD) sampler during gas metal arc welding (GMAW) of mild and stainless steel and flux-cored arc welding (FCAW) of mild steel. Several welders also wore side-by-side NRD samplers and closed-face filter cassettes for total particulate samples. The NRD sampler estimates the aerosol's nano-fraction deposited in the respiratory system. Mn concentrations for both welding processes ranged 2.8–199 $\mu\text{g}/\text{m}^3$; Ni concentrations ranged 10–51 $\mu\text{g}/\text{m}^3$; and Cr concentrations

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ranged 40–105 $\mu\text{g}/\text{m}^3$. Cr(VI) concentrations ranged between 0.5–1.3 $\mu\text{g}/\text{m}^3$. For the FCAW process the largest concentrations were reported for welders working in pairs. As a consequence this often resulted in workers being exposed to their own welding fumes and to those generated from the welding partner. Overall no correlation was found between air velocity and exposure ($R^2 = 0.002$). The estimated percentage of the nano-fraction of Mn deposited in a mild-steel-welder's respiratory system ranged between 10 and

56%. For stainless steel welding, the NRD samplers collected 59% of the total Mn, 90% of the total Cr, and 64% of the total Ni. These results indicate that most of the Cr and more than half of the Ni and Mn in the fumes were in the fraction smaller than 300 nm.

Read more: Journal of Occupational and Environmental Hygiene Volume 12, Issue 10, 2015 (Available with AIHA membership)

Potential Explosion Hazard of Carbonaceous Nanoparticles: Explosion Parameters of Selected Materials



Following a previous explosion screening study, we have conducted concentration and ignition energy scans on several carbonaceous nanopowders: fullerene, SWCNT, carbon black, MWCNT, graphene,

CNF, and graphite. We have measured minimum explosive concentration (MEC), minimum ignition energy (MIE), and minimum ignition temperature (MITcloud) for these materials. The nanocarbons exhibit MEC 10¹-10² g/m³, comparable to the MEC for coals and for fine particle carbon blacks and graphites. The nanocarbons are confirmed mainly to be in the St-1 explosion class, with fullerene, at KSt 200 bar-m/s, borderline St-1/St-2. We estimate MIE 10²-10³ J, an order of magnitude higher than the MIE for coals but an order of magnitude lower than the MIE for fine particle graphites. While the explosion severity of the nanocarbons is comparable to that of the coals, their explosion susceptibility (ease of ignition) is significantly less (i.e., the nanocarbons have higher MIEs than do the coals); by contrast, the nanocarbons exhibit similar explosion severity to the graphites but enhanced explosion susceptibility (i.e.,

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thenanocarbons have lower MIEs than do the graphites). MITcloud> 550.C, comparable to that of the coals and carbon blacks.

Read more: <http://www2a.cdc.gov/nioshtic-2/BuildQyr.asp?s1=20046146&f1=%2A&Startyear=&Adv=0&terms=1&EndYear=&Limit=10000&sort=&D1=10&PageNo=1&RecNo=1&View=f&>

Regulatory Research & Industrial Hygiene Professional News

AIHA

Just Published: Fourth Edition of "A Strategy for Assessing and Managing Occupational Exposures"

One of the core principles of industrial and occupational hygiene is exposure risk assessment, which is also a critical element of the overall risk assessment process. In 1991, the AIHA Exposure Assessment Strategies Committee (EASC) published the first edition of A Strategy for Assessing and Managing Occupational Exposures. In the intervening 24 years, workplaces have grown exponentially in complexity. The exposure assessment process and its tools have evolved to meet these growing



demands for the industrial hygiene professional.

Read more: <https://www.aiha.org/publications-and-resources/TheSynergist/AIHANews/Pages/Just-Published-Fourth-Edition-of-A-Strategy-for-Assessing-and-Managing-Occupational-Exposures.aspx>

ASHRAE

Updated IAQ Guideline Addresses Concerns about Ultrafine Particles

The 2015 version of ASHRAE's residential indoor air quality (IAQ) guideline recommends that higher-efficiency filters be considered to help filter out particles

below 2.5 microns (PM_{2.5}), which are "more hazardous to human health than originally thought," according to recent research cited by ASHRAE. Guideline 24-

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2015, Ventilation and Indoor Air Quality in Low-Rise Residential Buildings, includes explanatory and educational information on achieving good IAQ that goes beyond the requirements of ASHRAE's Standard 62.2, Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings.

The guideline is intended as a companion document to Standard 62.2.

Read more:

<https://www.aisa.org/publications-and-resources/TheSynergist/Industry%20News/Pages/Updated-IAQ-Guideline-Addresses-Concerns-about-Ultrafine-Particles.aspx>

EPA

Inspector General: EPA's Unapproved Asbestos Removal Methods May Put Workers, Public at Risk



According to this Early Warning Report, "Use of Unapproved Asbestos Demolition Methods May Threaten Public Health," unapproved approaches asbestos removal are in use or under consideration at several EPA sites, including the Hanford Superfund Site in Washington state. One alternative

method, dubbed the "wet method," entails hosing down the debris during building demolition in order to contain the asbestos. EPA, however, "has not approved or shown that these 'wet' methods are protective of human health," the report stated.

Read more:

<http://ehstoday.com/standards/epa/EPA-unapproved-asbestos-removal-1219>

The German Automaker Adopted A "Defeat Device" To Trick Regulators, the EPA Said

The EPA accused Volkswagen of installing software on 482,000 diesel cars in the U.S. to evade federal emission regulations, potentially exposing people to harmful pollutants.

The German automaker adopted what the EPA called a "defeat device" to trick U.S.



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regulators into believing that its cars met Clean Air Act standards, the federal agency said in a statement.

The agency said the diesel cars that violated federal standard were the 2009-14 Volkswagen Jetta, Beetle and Golf, the 2014-15 Volkswagen Passat, and the 2009-15 Audi A3.

Read more:

<http://www.usatoday.com/story/money/cars/2015/09/18/epa-accuses-volkswagen-audi-evading-emission-laws/72400018/>

NIOSH

Recognize N95 Day on September 4, 2015 - A Day Earlier, But another Year Wiser

Another N95 Day has come and gone. But the tools and resources are still available. So keep the celebration going all year long. It's never too late to participate in #N95Day. See below for a summary of events from September 04.

Read more:

<http://www.cdc.gov/niosh/npptl/N95Day.html>



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Training

APHC

Upcoming Training

	October 2015 <ul style="list-style-type: none">• Oct 1-5 APG, MD DOEHRS-IH Initial Army Course• Phase 1 Intermediate Industrial Hygiene Course Ongoing at this time (web)
	February 2016 <ul style="list-style-type: none">• February 22-26 APG, MD DOEHRS-IH Initial Army Course• February 29-March 4 APG, MD Industrial Ventilation Course
	March 2016 <ul style="list-style-type: none">• March 7-11 APG, MD Industrial Hygiene Intermediate Course (Phase 2)
	May 2016 <ul style="list-style-type: none">• May 16-20 APG, MD DOEHRS-IH Initial Army Course
	August 2016 <ul style="list-style-type: none">• August 1-5 APG, MD DOEHRS-IH Initial Army Course
	October 2016 <ul style="list-style-type: none">• October 24-28 APG, MD DOEHRS-IH Initial Army Course
	August 2016 <ul style="list-style-type: none">• August 1-5 APG, MD DOEHRS-IH Initial Army Course
	TBD 2016 <ul style="list-style-type: none">• Date/Location TBD Indoor Air Quality Course CP12 Sponsored
	February 2017 <ul style="list-style-type: none">• TBD APG, MD Blueprint Reading & Design Review Course

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<http://phc.amedd.army.mil/topics/workplacehealth/ih/Pages/default.aspx>



Transitioning to a New Format!

Please be patient while we transition to a new training format. In the past, the APHC Blackboard courses were dependent on Defense Connect Online recordings; however, DCO is no more, our existing material is being converted to a new format that automatically allows recordings to play within Blackboard. Continue to check the training website as we add course material daily. Some courses are already up and running. So visit <https://aiph-dohs.ellc.learn.army.mil> to check their availability.

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