

September 2016,

Issue 61

# Army Industrial Hygiene News and Regulatory Summary

## Hazardous Substances

### CSB Report: Communication, Maintenance Deficiencies Contributed to Severity of W.Va. Chemical Spill

#### Special Interest Articles:

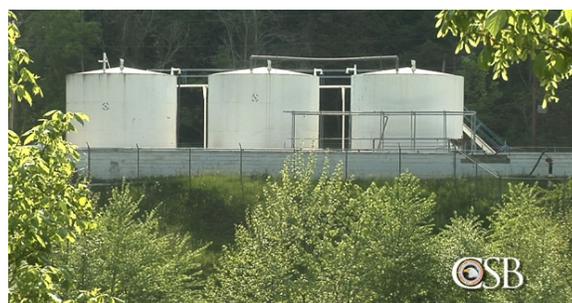
- [Antineoplastic  
Drugs](#)
- [Respirator  
Comfort](#)
- [Cadmium  
Exposure](#)
- [Physical  
Ability  
Testing](#)
- [Dosing  
Methods](#)

DOEHRS Super Star

A new U.S. Chemical Safety Board (CSB) report concludes that Freedom Industries failed to inspect and repair corroding tanks at its chemical storage and distribution facility in Charleston, W.Va., which released chemicals into the Elk River, Charleston's public water supply, in 2014. CSB's investigation also found that the company was unable to immediately provide information regarding the chemicals' characteristics, which delayed communication of the risks of drinking water contamination to the approximately 300,000 people affected.

The Jan. 9, 2014, spill released approximately 10,000 gallons of chemicals. The primary component of the spill was crude 4-methylcyclohexane methanol (MCHM), a liquid used to wash coal. Other chemicals present in smaller amounts included dipropylene glycol phenyl ether (DiPPH) and propylene glycol phenyl ether (PPH). Freedom initially reported that only 1,000 gallons of crude MCHM had been released, and the presence of PPH

in the chemicals spilled was not made public until 13 days following the leak.



Read more:

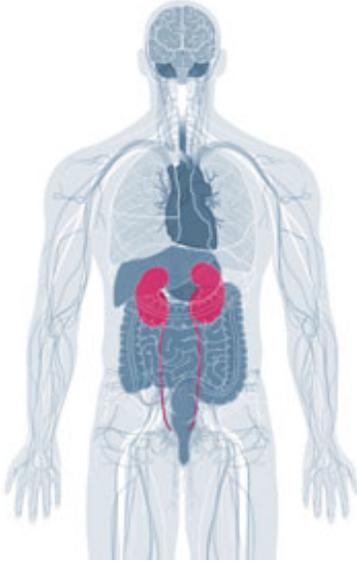
<https://www.aiha.org/publications-and-resources/TheSynergist/Industry%20News/Pages/CSB-Report-Communication,-Maintenance-Deficiencies-Contributed-to-Severity-of-W.Va.-Chemical-Spill.aspx>

Contents:



[Hazardous  
Substance](#)..... 1  
[Radiation](#).....6  
[Ventilation](#).....6  
[PPE](#).....7  
[Noise](#).....9  
[Preventive  
Medicine](#).....10  
[Environmental  
Health](#).....14  
[Ergonomics](#).....18  
[Safety](#).....19  
[Emergency  
Preparedness  
& Response](#).....22  
[Deployment  
Health](#).....23  
[Nanotech](#).....24  
[Regulatory  
Research  
& IH News](#) .....25  
[Training](#).....28

## PM<sub>2.5</sub> and Kidney Function: Long-Term Exposures May Lead to Modest Declines



Exposure to fine particulate matter (PM<sub>2.5</sub>) is associated with cardiovascular health impacts including increased risk of

irregular heartbeat and pulmonary embolism (arterial blockage).<sup>1</sup> However, the relationship between PM<sub>2.5</sub> and renal function, an independent cardiovascular risk factor<sup>2,3</sup> and significant health metric in its own right,<sup>4,5,6,7</sup> is poorly understood. A new longitudinal study offers early evidence that PM<sub>2.5</sub> exposure is associated with lower kidney function and a higher rate of kidney function decline over time.<sup>8</sup>

Read more:

<http://ehp.niehs.nih.gov/124-A168/>

## Asbestos Stymies Train Crash Investigation

National Transportation Safety Board (NTSB) investigators looking into the crash of the New Jersey commuter train ran into a roadblock while attempting to retrieve the event recorder and camera from the controlling cab. When the train struck the Hoboken Terminal, the incident exposed asbestos in the historic



## Army Industrial Hygiene News and Regulatory Summary

building. The asbestos – in addition to extensive debris -- will have to be safely removed before the train’s “black box” can be accessed and examined.

Read more:

<http://www.ishn.com/articles/104999-asbestos-stymies-train-crash-investigation>

### A Review of Surface Wipe Sampling Compared to Biologic Monitoring for Occupational Exposure to Antineoplastic Drugs



Workers handling hazardous drugs need protection to prevent potentially harmful exposure.

Antineoplastic drugs (AD) have well-established carcinogenic, mutagenic and reproductive adverse effects among patients receiving these agents. Most are hazardous to health in some respect and many AD are listed by the International Agency for Research on Cancer as probable or known carcinogens to humans<sup>(1)</sup> Pharmaceuticals. Volume 100 A. A review of human carcinogens. *IARC Monogr Eval Carcinog Risks Hum* 100(Pt A): 1–401 (2012). Healthcare workers (HCW) preparing and administering AD and caring for cancer patients have been shown to be exposed to these agents in numerous studies of environmental monitoring, absorption<sup>(2)</sup> Sorsa, M., and D. Anderson: Monitoring of occupational exposure to

cytostatic anticancer agents. *Mutat Res* 355(1–2): 253–261 (1996).[CrossRef], [PubMed], [Web of Science<sup>®</sup>], [CSA], and biologic effect. A 2004 report from the National Institute for Occupational Safety and Health (NIOSH) states exposure to hazardous drugs including antineoplastic drugs can potentially lead to a number of health effects including adverse reproductive events and cancer<sup>(3)</sup> NIOSH: Preventing occupational exposures to antineoplastic and other hazardous drugs in healthcare settings 2004. *U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health* DHHS (NIOSH) Publication No 2004(165)(2004).

This NIOSH *Alert* calls for medical and biologic surveillance of HCW involved in preparing and administering AD, and environmental monitoring where available. To date there are no established guidelines or published best practices for this AD workplace monitoring to guide managers of environmental, health and safety (EHS) programs.

Read more: *Journal of Occupational and Environmental Hygiene* accepted author

version posted online: 27 Sep 2016  
(Available with AIHA membership)

## U.S. Troops in Iraq Brace for More 'Mustard' Attacks

U.S. troops in Iraq are facing the threat of more chemical weapons attacks as Islamic State militants prepare to defend against a final invasion of Mosul, a defense official said.

The dire warning from the Pentagon comes almost one week after a shell that tested positive for “mustard agent” landed inside the wire at Qayara West, an Iraqi-controlled air base where several hundred U.S. forces are helping Iraqi Army units build a staging area for the upcoming offensive into Mosul.

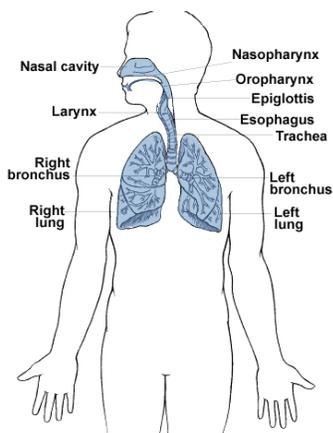
“I think we can fully expect, as this road toward Mosul progresses, [the Islamic State group] is likely to try to use it again, said Navy Capt. Jeff Davis, a Pentagon spokesman.



Read more:

<http://www.militarytimes.com/articles/us-troops-brace-for-more-mustard-attacks>

## Assessment of Increased Sampling Pump Flow Rates in a Disposable, Inhalable Aerosol Sampler



A newly designed, low-cost, disposable inhalable aerosol sampler was developed to assess workers personal

exposure to inhalable particles. This sampler was originally designed to operate at 10L/min to increase sample mass and, therefore, improve analytical detection limits for filter-based methods. Computational fluid dynamics modeling revealed that sampler performance (relative to aerosol inhalability criteria) would not differ substantially at sampler flows of 2 and 10L/min. With this in mind, the newly designed inhalable aerosol

sampler was tested in a wind tunnel, simultaneously, at flows of 2 and 10L/min flow. A mannequin was equipped with 6 sampler/pump assemblies (three pumps operated at 2L/min and three pumps at 10L/min) inside a wind tunnel, operated at 0.2m/s, which has been shown to be a typical indoor workplace wind speed. In separate tests, four different particle sizes were injected to determine if the sampler's performance with the new 10L/min flow rate significantly differed to that at 2L/min. A comparison between inhalable mass concentrations using a Wilcoxon signed rank test found no significant difference in

the concentration of particles sampled at 10 and 2L/min for all particle sizes tested. Our results suggest that this new aerosol sampler is a versatile tool that can improve exposure assessment capabilities for the practicing industrial hygienist by improving the limit of detection and allowing for shorting sampling times.

*Read more: Journal of Occupational and Environmental Hygiene accepted author version posted online: 27 Sep 2016, (Available with AIHA membership)*

### Existence and Control of *Legionella* Bacteria in Building Water Systems: A Review

*Legionellae* are waterborne bacteria which are capable of causing potentially fatal Legionnaires' disease (LD), as well as Pontiac Fever. Public concern about *Legionella* exploded following the 1976 outbreak at the American Legion conference in Philadelphia, where 221 attendees contracted pneumonia and 34 died. Since that time, a variety of different control methods and strategies have been developed and implemented in an effort to eradicate *Legionella* from building water systems. Despite these efforts, the incidence of LD has been steadily increasing in the U.S. for more than a decade. Public health and occupational hygiene professionals have maintained an active debate regarding best practices for management and control of *Legionella*. Professional opinion remains divided with



respect to the relative merits of performing routine sampling for *Legionella*, versus the passive, reactive approach that has been largely embraced by public health officials and facility owners. Given the potential risks and ramifications associated with waiting to assess systems for *Legionella* until after disease has been identified and confirmed, a proactive approach of periodic testing for *Legionella*, along with proper

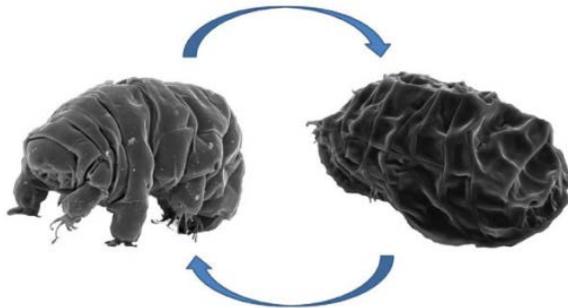
water treatment, is the best approach to avoiding large-scale disease outbreaks.

version posted online: 13 Sep 2016  
(Available with AIHA membership)

Read more: *Journal of Occupational and Environmental Hygiene* accepted author

## Radiation

### Tardigrade Protein Helps Human DNA Withstand Radiation



Tardigrades, or water bears, are pudgy, microscopic animals that look like a cross between a caterpillar and a naked mole rat. These aquatic invertebrates are consummate survivors, capable of withstanding a host of extremes, including

near total dehydration and the insults of space.

Now, a paper<sup>1</sup> published on 20 September in *Nature Communications* pinpoints the source of yet another tardigrade superpower: a protective protein that provides resistance to damaging X-rays. And researchers were able to transfer that resistance to human cells.

Read more:

<http://www.nature.com/news/tardigrade-protein-helps-human-dna-withstand-radiation-1.20648>

## Ventilation

### Fan Selections and Their Energy Impacts

Fans and fan systems can be significant consumers of energy in commercial applications and the greatest consumer in industrial ones. Concerned about underperformance, designers tend to compensate for uncertainties by adding capacity to fans. Oversizing fan systems creates problems that can increase costs



and decrease reliability. This article explains how to evaluate fans and fan systems and their impact on operating costs. It does so by examining the criteria most commonly used in fan selection:

- Air-stream characteristics.
- Capacity.
- Pressure.
- Power.

- Efficiency.
- Fan and system curves.

Read more: <http://hpac.com/iaq-ventilation/fan-selections-and-their-energy-impacts-part-2-2>

### PPE

## Filter Penetration and Breathing Resistance Evaluation of Respirators and Dust Masks



The primary objective of this study was to compare the filter performance of a representative selection of uncertified dust masks relative to the filter performance of a set of NIOSH-approved N95 filtering face-piece respirators (FFRs). Five different models of commercially available dust masks were selected for this study. Filter penetration of new dust masks was evaluated against a sodium chloride aerosol. Breathing resistance (BR) of new

dust masks and FFRs was then measured for 120 min while challenging the dust masks and FFRs with Arizona road dust (ARD) at 25°C and 30% relative humidity. Results demonstrated that a wide range of maximum filter penetration was observed among the dust masks tested in this study (3 – 75% at the most penetrating particle size ( $p < 0.001$ )). The breathing resistances of the unused FFRs and dust masks did not vary greatly (8 – 13 mm H<sub>2</sub>O) but were significantly different ( $p < 0.001$ ). After dust loading there was a significant difference between the BR caused by the ARD dust layer on each FFR and dust mask. Microscopic analysis of the external layer of each dust mask and FFR suggests that different collection media in the external layer influences the development of the dust layer and therefore affects the increase in BR differently between the tested models. Two of the dust masks had penetration values  $< 5\%$  and quality factors (0.26 and 0.33) comparable to those

obtained for the two FFRs (0.23 and 0.31). However, the remaining three dust masks, those with penetration > 15%, had quality factors ranging between 0.04 – 0.15 primarily because their initial BR remained relatively high. These results indicate that some dust masks analysed during this research did not have an expected very low

BR to compensate for their high penetration.

*Read more: Journal of Occupational and Environmental Hygiene accepted author version posted online: 27 Sep 2016 (Available with AIHA membership)*

### Development and Initial Validation of the Respirator Comfort, Wearing Experience, and Function Instrument [R-COMFI]

**Background.** Filtering face-piece respirators (FFRs) are worn to protect health care personnel from airborne particles; however, clinical studies have demonstrated that FFR adherence is relatively low in some settings, in part, due to discomfort and intolerance. The objective of this study was to develop and initially evaluate the psychometric properties of an instrument designed to measure the comfort and tolerability of FFRs.

**Methods.** Instrument items were developed through literature reviews, focus groups, and several iterations of ranking and refining by experts. Psychometric evaluation of the instrument was conducted using Rasch partial credit model (PCM) analysis. Pivot anchoring was used to specify the threshold defining item difficulty; in our analyses, this was the point that participants moved from possessing none of the trait to some of the trait.

**Results:** The final instrument was completed by 165 health care personnel from 3 Veterans Health Administration facilities, and data were analyzed using

Rasch PCM. Seven items were removed because they: 1) violated the assumption of independence, 2) were mis-fitting, and/or 3) were deemed not relevant. Category function analysis demonstrated that all categories progressed monotonically. Principal components analysis demonstrated the existence of three subscales (Discomfort, General Wearing Experience, and Function). Final reliability analyses showed that the scale had moderate to high person reliability and high item reliability. The final instrument contained 21 items.

**Discussion/Conclusion:** Until now, to our knowledge no instrument with evidence supporting its reliability and validity to assess discomfort and tolerance of FFRs among health care personnel has been published. A 21-item psychometrically sound measure of comfort and tolerability of FFRs, *Respirator Comfort, Wearing Experience, and Function Instrument (R-COMFI)*, was developed. The significance of developing such an instrument is that it will help identify respirators that are likely to have better adherence in practice settings.

The R-COMFI may be used within and beyond the VA healthcare system as a psychometrically sound instrument to evaluate the comfort and tolerability of respirators, including developmental prototypes.

*Read more: Journal of Occupational and Environmental Hygiene accepted author version posted online: 16 Sep 2016 (Available with AIHA membership)*

### Noise

## Daily Dose of Caffeine Impairs Recovery after Noise-Induced Hearing Loss

A new study by investigators at the Research Institute of the McGill University Health Centre (RI-MUHC) has discovered that daily consumption of caffeine can impair recovery after temporary hearing damage. The results are published in the Journal of the American Medical Association. Since both caffeine intake and noise related hearing loss are so common in our society, these findings could have a significant impact on the general population, especially for those who ingest high doses of caffeine regularly.

Excessive noise is a serious health concern in many workplace environments, from the construction industry, to aviation, mining, and manufacturing. Concerts and other social events can also be an important source of noise, where sound levels may exceed health recommendations and can lead to hearing damage



*Read more:*  
<https://muhc.ca/newsroom/news/daily-dose-caffeine-impairs-recovery-after-noise-induced-hearing-loss>

## **Can't Hear In Noisy Places? It's a Real Medical Condition**



The problem is sometimes called “hidden hearing loss”: Standard hearing tests don’t measure it, and sufferers are often told their hearing is normal. But the distress they feel struggling to discern what others are saying in crowded restaurants and business meetings is real

*Read more:*

<http://www.foxnews.com/health/2016/09/27/cant-hear-in-noisy-places-its-real-medical-condition.html>

Many people have trouble understanding conversations in noisy situations. Scientists are beginning to understand why.

## ***Preventive Medicine***

### **Here's How Much You Need to Exercise If You Sit at a Desk All Day, According to Science**

The perils of sitting all day aren't good. Researchers have shown that remaining stationary for extended periods of time (like at your 9-to-5 desk job) can be detrimental to your health. While exercise is a big part of offsetting the harmful effects of sitting, it was unclear how many gym sessions were needed to help — until now.

A new study, published in *The Lancet*, shows the ideal formula for counteracting the negative effects of a sedentary job. Instead of a fixed number of hours spent exercising, the ratio depends on how much



you sit: people who work a typical eight-hour day should spend at least one hour each day moving; if you sit six hours a day, you should spend half an hour exercising.

## Army Industrial Hygiene News and Regulatory Summary

The research also indicated that the exercise doesn't have to be all at once — or rigorous. It can be spread throughout the day and be as simple as walking.

Read more:

<http://www.popsugar.com/fitness/Exercise-Formula-Counteract-Sitting-42113170>

### Plumbing Pathogens Costly and Increasingly Resistant to Antibiotics



Additionally, growing antibiotic resistance to OPPP raises the economic burden of disease.

After looking at 100 million Medicare records, researchers identified 617,291 hospitalized infections caused by three OPPPs: *Legionella pneumophila*, *Mycobacterium avium*, and *Pseudomonas aeruginosa*. Calculations showed that the three OPPP infections in elderly patients cost about \$600 million per year over the study period. Antibiotic resistance was present in about 2% of those cases, but when it was present, it was resistant to multiple drugs.

Read more:

<http://www.cidrap.umn.edu/news-perspective/2016/09/news-scan-sep-12-2016> (Scroll down to the 4th heading)

A study today in the *Journal of Public Health Policy* examined US hospitalizations caused by opportunistic premise plumbing pathogens (OPPP) like legionellosis from 1991 to 2006 and found they are costly, especially among those over the age of 65.

### Physical Inactivity among Adults Aged 50 Years and Older — United States, 2014

Physical activity can help delay, prevent, or manage many of the chronic diseases for which adults aged  $\geq 50$  years are at risk (1–

3). These diseases can impact the length and quality of life, as well as the long-term ability to live independently.\* All adults

## Army Industrial Hygiene News and Regulatory Summary

aged  $\geq 50$  years, with or without chronic disease, gain health benefits by avoiding inactivity (2,3). To examine the prevalence of inactivity by selected demographic characteristics and chronic disease status in mid-life and older adults, CDC analyzed data on adults aged  $\geq 50$  years from the 2014 Behavioral Risk Factor Surveillance System (BRFSS). Overall, 27.5% of adults aged  $\geq 50$  years reported no physical activity outside of work during the past month. Inactivity prevalence significantly increased with increasing age and was 25.4% among adults. Inactivity prevalence significantly increased with decreasing levels of education and increasing body mass index. To help adults with and without chronic disease start or maintain an active lifestyle, communities can implement evidence-based strategies, such as creating or enhancing access to places for physical activity, designing communities and streets to encourage physical activity, and offering programs that address specific barriers to physical activity.

aged 50–64 years, 26.9% among those aged 65–74 years, and 35.3% among those aged  $\geq 75$  years. Inactivity prevalence was significantly higher among women than men, among Hispanics and non-Hispanic blacks than among non-Hispanic whites, and among adults who reported ever having one or more of seven selected chronic diseases than among those not reporting one.



*Read more:*

[http://www.cdc.gov/mmwr/volumes/65/wr/mm6536a3.htm?s\\_cid=mm6536a3\\_w](http://www.cdc.gov/mmwr/volumes/65/wr/mm6536a3.htm?s_cid=mm6536a3_w)

## More Than 9 in 10 People Breathe Bad Air, W.H.O. Study Says



The World Health Organization said Tuesday that 92 percent of people breathe what it classifies as unhealthy air, in another sign that atmospheric pollution is a significant threat to global public health. A new report, the W.H.O.'s most comprehensive analysis so far of outdoor

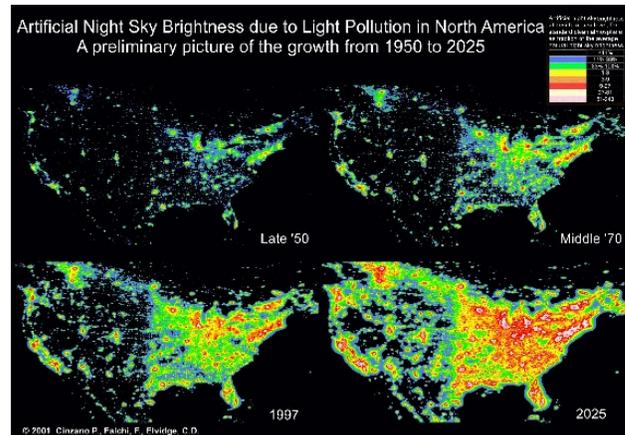
air quality worldwide, also said about three million deaths a year — mostly from cardiovascular, pulmonary and other noncommunicable diseases — were linked to outdoor air pollution. Nearly two-thirds of those deaths are in Southeast Asia and the Western Pacific region, compared with 333,000 in Europe and the Americas, the report said.

*Read more:*

<http://www.nytimes.com/2016/09/28/world/air-pollution-smog-who.html>

## Some Cities Are Taking another Look at LED Lighting after AMA Warning

If people are sleepless in Seattle, it may not be only because they have broken hearts. The American Medical Association issued a warning in June that high-intensity LED streetlights — such as those in Seattle, Los Angeles, New York, Houston and elsewhere — emit unseen blue light that can disturb sleep rhythms and possibly increase the risk of serious health conditions, including cancer and cardiovascular disease. The AMA also cautioned that those light-emitting-diode lights can impair nighttime driving vision. Similar concerns have been raised over the past few years, but the AMA report adds credence to the issue and is likely to prompt cities and states to reevaluate the intensity of LED lights they install.



Read more:

[https://www.washingtonpost.com/national/health-science/some-cities-are-taking-another-look-at-led-lighting-after-ama-warning/2016/09/21/98779568-7c3d-11e6-bd86-b7bbd53d2b5d\\_story.html](https://www.washingtonpost.com/national/health-science/some-cities-are-taking-another-look-at-led-lighting-after-ama-warning/2016/09/21/98779568-7c3d-11e6-bd86-b7bbd53d2b5d_story.html)

## Bike Lanes Are a Sound Public Health Investment



Every \$1,300 New York City invested in building bike lanes in 2015 provided benefits equivalent to one additional year of life at full health over the lifetime of all city residents, according to a new economic assessment.

That's a better return on investment than some direct health treatments, like dialysis, which costs \$129,000 for one quality-adjusted life year, or QALY, said coauthor Dr. Babak Mohit of the Mailman School of

Public Health at Columbia University in New York.

Our greatest public health intervention, vaccines, take about \$100 investment to yield one QALY, Mohit told Reuters Health by phone.

Read more:

<http://www.foxnews.com/health/2016/09/29/bike-lanes-are-sound-public-health-investment.html>

## Environmental Health

### Gender-Dependent Effects of Cadmium Exposure in Early Life on Gut Microbiota and Fat Accumulation in Mice

**Background:** Environmental cadmium, with a high average dietary intake, is a severe public health risk. However, the long-term health implications of environmental exposure to cadmium in different life stages remain unclear.

**Objectives:** To investigate the effects of early exposure to cadmium, at an environmentally relevant dosage, on adult metabolism and the mechanism of action.

**Methods:** We established mouse models with low-dose cadmium (LDC) exposure in early life to examine the long-term metabolic consequences. Intestinal flora measurement by 16S rDNA sequencing, microbial ecological analyses, and fecal microbiota transplant was conducted to explore the potential underlying mechanisms.

**Results:** Early LDC exposure (100 nM) led to fat accumulation in adult male mice. Hepatic genes profiling revealed that fatty acid and lipid metabolic processes were



elevated. Gut microbiota were perturbed by LDC to cause diversity reduction and compositional alteration. Time series studies indicated that the gut flora at early-life stages, especially at 8 weeks, were vulnerable to LDC and that an alteration during this period could contribute to the adult adiposity, even if the microbiota recovered later. The importance of intestinal bacteria in LDC-induced fat accumulation was further confirmed through microbiota transplantation and removal experiments. Moreover, the

metabolic effects of LDC were observed only in male, but not female, mice.

**Conclusions:** An environmental dose of cadmium at early stages of life causes gut microbiota alterations, accelerates hepatic lipid metabolism, and leads to life-long metabolic consequences in a gender-

dependent manner. These findings provide a better understanding of the health risk of cadmium in the environment.

*Read more:*

<http://ehp.niehs.nih.gov/ehp360/>

### Smoke Signals: Teasing Out Adverse Health Effects of Wildfire Emissions



Worldwide, the preponderance and severity of wildfires is increasing due to a number of factors, among them changes in temperature and precipitation patterns consistent with climate change.<sup>1,2</sup> Aside from the acute threat of imminent death, wildfires expose people to a range of harmful pollutants in smoke.<sup>3</sup> Although health effects are well documented for

many of these individual pollutants—including carbon monoxide, nitrogen dioxide, particulate matter, and more—it is difficult to gauge the public health impact posed specifically by wildfire smoke inhalation. In a new review, investigators present evidence linking wildfire smoke exposures to increased overall mortality rates and multiple respiratory conditions.<sup>4</sup> The authors reviewed 53 epidemiological studies that assessed mortality and morbidity outcomes in relation to wildfire smoke. They specifically targeted studies on respiratory, cardiovascular, mental, and perinatal health.

*Read more:* <http://ehp.niehs.nih.gov/124-A166/>

### Vegetation Delight? Greenness and Reduced Risk of Nonaccidental Death

Although more than half of humanity now lives in urban areas,<sup>1</sup> we have by and large retained a love for green spaces. A growing body of research suggests that exposure to

“greenness” (i.e., vegetation) can improve both physical and mental health.<sup>2</sup> However, studies linking the greenness of an area to mortality have been limited in looking at

## Army Industrial Hygiene News and Regulatory Summary

populations over time. Environmental epidemiologist Peter James and his colleagues at the Harvard T.H. Chan School of Public Health addressed this gap with a long-term study of U.S. women. They found that living in more densely vegetated areas was associated with fewer deaths from causes other than accidents.<sup>3</sup>

The researchers began with data from the Nurses' Health Study. This prospective study began in 1976 and enrolled 121,701 registered nurses aged 30–55. Scientists have tracked more than 90% of participants since then, and by the time of the current

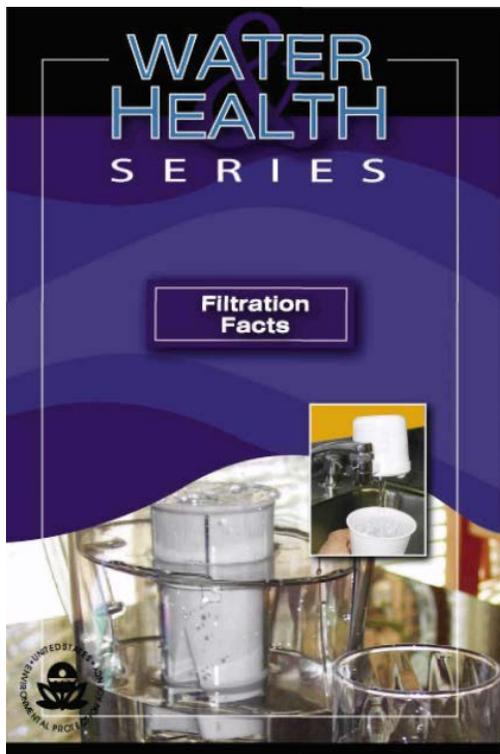
study, at least 10 nurses lived in each of the 48 contiguous states.



Read more:

<http://ehp.niehs.nih.gov/124-A169/>

### Coffee-Infused Foam Removes Lead from Contaminated Water



Coffee is one of the most popular drinks in the U.S., which makes for a perky

population - but it also creates a lot of used grounds. Scientists now report in the journal *ACS Sustainable Chemistry & Engineering* an innovative way to reduce this waste and help address another environmental problem. They have incorporated spent coffee grounds in a foam filter that can remove harmful lead and mercury from water.

Restaurants, the beverage industry and people in their homes produce millions of tons of used coffee grounds every year worldwide, according to researcher Despina Fragouli. While much of the used grounds go to landfills, some of them are applied as fertilizer, used as a biodiesel source or mixed into animal feed. Scientists are also studying it as a possible material for water remediation. Experiments so far have shown that powder made from spent coffee grounds can rid water of heavy metal ions, which can cause health problems. But an

## Army Industrial Hygiene News and Regulatory Summary

additional step is needed to separate the powder from the purified water. Fragouli and colleagues wanted to simplify this process.

*Read more:*

[http://www.healthnewsdigest.com/news/Research\\_270/Coffee-infused-Foam-Removes-Lead-from-Contaminated-Water.shtml](http://www.healthnewsdigest.com/news/Research_270/Coffee-infused-Foam-Removes-Lead-from-Contaminated-Water.shtml)

### Ambulances with 'Green' Idling Reduction Technology

Anyone that has ever walked by a pre-positioned ambulance has probably wondered: *why is that vehicle constantly at idle? That sure is noisy. What a waste of fuel. All that exhaust can't be great for the environment.*

While quick response is a factor, the real purpose that ambulances must idle—even while parked—is to keep all the electrically powered devices that they depend on running. These include vehicle heat or air conditioning; cameras and lights; computers used by the EMS techs; radios, other communication devices and vehicle security systems; electrocardiogram, defibrillators and other medical devices; and, refrigerators needed to store certain medicines.

Unfortunately, keeping an ambulance idling to perform all these tasks burns about 1.5 gallons of fuel and puts 35-50 miles' worth of wear-and tear on the engine *per hour*.



Multiply that by an estimated 50,000 ambulances in service in the United States and that is a lot of fuel, engine wear, maintenance and repair costs and overall reduction in service life of a vehicle.

*Read more:*

[http://www.healthnewsdigest.com/news/Environment\\_380/Ambulances-with-Green-Idling-Reduction-Technology.shtml](http://www.healthnewsdigest.com/news/Environment_380/Ambulances-with-Green-Idling-Reduction-Technology.shtml)

## Ergonomics

### The Right Balance: Using Physical Abilities Testing to Reduce Injuries



Since 1998, the American workforce has been increasing its speed to meet higher levels of productivity demands. With fewer

employees doing the same amount of work, the instance of slips, trips and falls continues to rise.

The Bureau of Labor Statistics cites a 37 percent jump from 1998-2007 in these types of injuries, with more than 25,000 slips, trips and falls reported daily. Reducing this statistic could start with pre-employment testing and incorporating balance exercises into a corporate wellness program, says Deborah Lechner, president of ErgoScience.

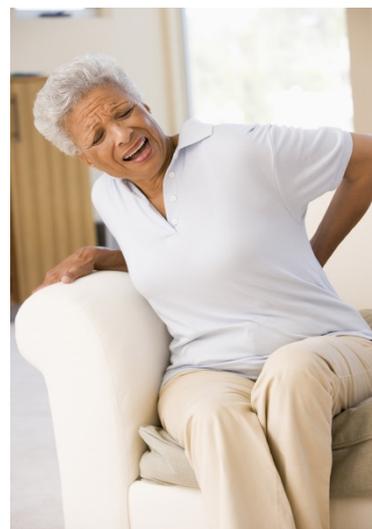
*Read more:*

<http://ehstoday.com/health/right-balance-using-physical-abilities-testing-reduce-injuries>

### Risk Factors for Back Pain

Who's most prone to back pain? The recent research indicates that men are more likely to suffer from lower back pain than women - 10.1% vs. 8.7% -- but that it's impossible to identify a specific cause of pain for about 85% of those who are coping with early-stage back issues.

On the other hand, Dr. Kadimcherla says, certain risk factors are proven to leave people more susceptible to back pain. These include:



## Army Industrial Hygiene News and Regulatory Summary

- Older age
- Obesity
- Stress
- Anxiety and/or depression
- *Smoking*
- *Occupations requiring significant lifting or extreme stress*

*groups, occupations, and education and income levels. But that doesn't mean back pain - or disability resulting from it - can't be avoided. It can."*

Read more:

[http://www.healthnewsdigest.com/news/Patient\\_230/Risk-Factors-for-Back-Pain.shtml](http://www.healthnewsdigest.com/news/Patient_230/Risk-Factors-for-Back-Pain.shtml)

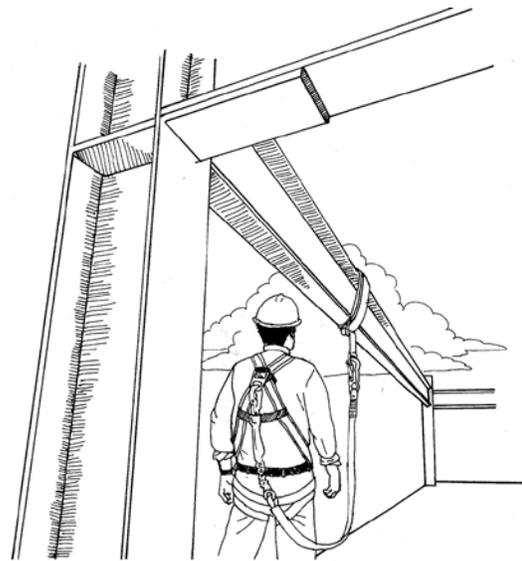
*"Ultimately, back pain doesn't discriminate," Dr. Kadimcherla says. "It's common across countries, genders, age*

## Safety

### Creating a Safer Workplace

Each year, falls from heights ranging from just a few inches to 120 stories account for more than 30 percent of all fall-related injuries and work-related deaths. Such injuries not only endanger the integrity of the workplace and the safety of employees, but also cost businesses millions of dollars each year in medical expenses, lost wages, and lower productivity.

Therefore, fall protection planning and the correct fall protection training are essential to ensuring the safety and health of your employees and your company. Developing a comprehensive fall protection and training plan is the right decision for the safety of employees, the financial health of the company, and the integrity of the product.



Read more:

<https://ohsonline.com/articles/2016/05/17/creating-a-safer-workplace.aspx>

## **Drug Positivity in U.S. Workforce Rises to Highest Level in a Decade**



Following years of declines, the percentage of employees in the combined U.S. workforce testing positive for drugs has steadily increased over the last three years to a 10-year high, according to an analysis of nearly 11 million workforce drug test results by Quest Diagnostics.

The Quest Diagnostics Drug Testing Index™ examines illicit drug use by America's workforce based on an analysis of de-identified results of more than 9.5 million urine, 900,000 oral fluid and 200,000 hair laboratory-based tests performed nationally by the company for employers in 2015. The findings were unveiled at the Substance Abuse Program Administrators Association (SAPAA) annual conference.

*Read more:*

<http://ehstoday.com/health/drug-positivity-us-workforce-rises-highest-level-decade>

## **Be Prepared For Whatever Nature Throws At You**

You have a better chance of keeping yourself, your vehicle and your passengers on the road to safety even when the weather is bad if you prepare in advance so your vehicle can be your refuge. These seven tips can help.

### **Take Inventory Inside**

Make sure you know what's inside your vehicle. See that you have a blanket, first aid kit, current snacks and an inflated spare tire; also, a cell phone charger and some basic tools. All those can be useful if your vehicle leaves you stranded.

### **Clean and Coat**

Your windshield allows you to see what's coming. Clean the inside thoroughly to



remove buildup, smoke and haze. On the outside, use a product such as Invisible Glass Clean & Repel to add a protective coating to help shed rain, snow and ice while increasing visibility.

# Army Industrial Hygiene News and Regulatory Summary

Read more:

<http://www.healthnewsdigest.com/news/S>

[afety\\_310/Be-Prepared-For-Whatever-Nature-Throws-At-You.shtml](http://www.healthnewsdigest.com/news/Safety_310/Be-Prepared-For-Whatever-Nature-Throws-At-You.shtml)

## Politics Is Taking Its Toll on U.S. Workers



What's the old saying? Avoid talking about religion and politics? This election season has been a tough one, not only for the candidates, but for American workers as well.

Workers are feeling stressed, argumentative and less productive because

of political discussions on the job, according to a survey released Sept. 14 by the American Psychological Association. More than one in four younger employees reported feeling stressed out because of political discussions at work, and more than twice as many men as women said political talk is making them less productive, according to the survey from APA's Center for Organizational Excellence. The "Politics in the Workplace: 2016 Election Season" survey was conducted online on APA's behalf by Harris Poll from Aug. 10-12. Nearly 1,000 U.S. adults who are employed full or part time responded to the survey.

Read more:

<http://ehstoday.com/health/politics-taking-its-toll-us-workers>

## Electric Fans May Exacerbate Heat Issues for Seniors

September 6, 2016 – Using electric fans to relieve high levels of heat and humidity may, surprisingly, have the opposite effect for seniors, a study by UT Southwestern Medical Center heart specialists suggests. The heart rate and internal temperature of seniors exposed to 107 degree Fahrenheit temperatures and increasing humidity levels climbed even higher when they tried to cool off with fans – instead of falling as



## Army Industrial Hygiene News and Regulatory Summary

expected, according to study findings reported in *JAMA*.

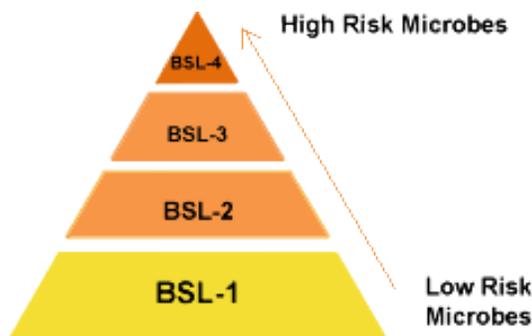
“Although differences were small, the cumulative effect could become clinically important during prolonged heat exposure, such as during extreme heat waves,” said Dr. Craig Crandall, Professor of Internal Medicine at UT Southwestern and with the Institute for Exercise and Environmental

Medicine at Texas Health Presbyterian Hospital Dallas, a joint operation of Texas Health Presbyterian Hospital Dallas and UT Southwestern.

*Read more:*

[http://www.healthnewsdigest.com/news/Seniors\\_320/Electric-Fans-May-Exacerbate-Heat-Issues-for-Seniors.shtml](http://www.healthnewsdigest.com/news/Seniors_320/Electric-Fans-May-Exacerbate-Heat-Issues-for-Seniors.shtml)

### Biosafety Labs and the Meaning of Biosafety Levels



A biosafety lab is a specialized research laboratory that deals with infectious agents. Some are designed for research, while others are performing some kind of production activity, but proper protection is of the utmost importance for the safety of everyone working in and around a biosafety lab. Protection is not only important for

those working in a building with a biosafety lab, but also for the environment and the community around the laboratory. The protection that is required for any biosafety laboratory is defined by what are known as biosafety levels. There are four levels, which are determined by the types of agents or organisms that the laboratory is working with. As the biosafety level increases, there are more requirements and constraints added to the necessary safety precautions that must be followed.

*Read more:* <https://www.environmental-expert.com/news/biosafety-labs-and-the-meaning-of-biosafety-levels-676171>

## Emergency Preparedness & Response

### Health Care Providers Scramble to Meet New Disaster Readiness Rule

An estimated 72,315 American health care providers and suppliers — from hospitals

and nursing homes to dialysis facilities and care homes for those with intellectual

## Army Industrial Hygiene News and Regulatory Summary

disabilities — will have a little over a year to meet federal disaster preparedness requirements completed this week by the Centers for Medicare and Medicaid Services.

The new rule is aimed at preventing the severe breakdown in patient care that followed disasters including Hurricane Katrina and Hurricane Sandy, while also strengthening the ability to provide services during other types of emergencies, such as pandemics and terrorist attacks. The rule is unusual in that it has provisions for 17 different provider types, among them those that patients rely on to live at home, like

outpatient surgery sites, physical therapy offices and home health agencies.



Read more:

<http://www.nytimes.com/2016/09/10/us/medicare-requirements-disaster-readiness.html?mabReward=CTM& r=0>

### Deployment Health

#### VA Proposes Rule to Consider Certain Diseases Associated with Exposure to Contaminants in the Water Supply at Camp Lejeune



The Department of Veterans Affairs (VA) has published proposed regulations to establish presumptions for the service connection of eight diseases affecting military members exposed to contaminants in the water supply at Camp Lejeune, N.C.

The presumptive illnesses apply to active duty, reserve and National Guard members who served for no less than 30 days at Camp Lejeune between August 1, 1953 and December 31, 1987, and are diagnosed with the following conditions:

- adult leukemia
- aplastic anemia and other myelodysplastic syndromes
- bladder cancer
- kidney cancer
- liver cancer
- multiple myeloma
- non-Hodgkin's lymphoma
- Parkinson's disease

Read more:

<http://www.va.gov/opa/pressrel/pressrelea>

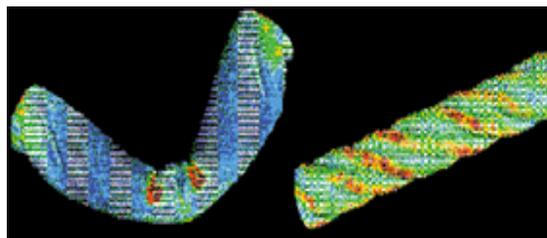
<se.cfm?id=2818>

## Nanotechnology

### ISO Publishes Standard for Compilation and Description of Sample Preparation and Dosing Methods for Engineered and Manufactured Nanomaterials

The International Organization for Standardization (ISO) published ISO/TR 16196:2016, “Nanotechnologies — Compilation and description of sample preparation and dosing methods for engineered and manufactured nanomaterials.” The goal of the standard is to assist scientists and experts to understand, plan, choose, and address issues relevant to nanomaterials before and during toxicological testing.

The descriptions of sample preparation method factors for both *in vitro* and *in vivo* toxicological testing of engineered and manufactured nanoscale materials include considerations about physico-chemical properties, media, methods for transformation and accumulation studies, health effects, and dosimetry. According to ISO, the standard focuses on factors that might lead to results that are not relevant to safety evaluations. When featured, the standard considers referenced methods for



their general interest and potential applicability.

ISO states that it is likely that most of the described methods are not generally applicable to all nanomaterials, but they do demonstrate important factors and limitations that are common for a variety of nanomaterials. ISO notes that the standard is not intended to be a literature review nor a thorough assessment of the quality of the methods or data generated. The standard is intended to complement other international efforts.

Read more: <http://www.nanotech-now.com/columns/?article=1108>

***Regulatory Research & Industrial Hygiene Professional News***

**DA**

**LabAnswer and the U.S. Army Deliver Global Laboratory Information Management in Support of World-Class Public Health Services for Army and DOD**



LabAnswer, recognized as a premier provider of laboratory informatics and scientific data management services, announced the deployment of an enterprise Laboratory Information Management System (LIMS) designed for the Army Public Health Center (Provisional) (APHC) and other public health regions within the U.S. Army Medical Command.

The U.S. Army Medical Command (MEDCOM) launched the LIMS solution in three Public Health Command Regions (PHCR) and one Public Health Command Districts (PHCD), including, PHCR-Central in San Antonio, Texas, PHCR-P in Hawaii, PHCR-Pacific in Japan, and PHCD-Korea. The rollout of the enterprise STARLIMS Laboratory Information Management System is transforming the Army's public health laboratory data management operations from a disparate portfolio of unconnected scientific applications to a powerful laboratory data platform that will drive operational efficiency and quality. The Army's public health laboratories will utilize metric reporting and analytics to improve the safety and public health of military active duty, retirees, their families, and its civilian employees.

*Read more:*

<http://www.prweb.com/releases/2016/09/prweb13652042.htm>

# Army Industrial Hygiene News and Regulatory Summary

**EPA**

## EPA Proposal Seeks Alignment with OSHA, NIOSH Regulations and GHS

	<b>Expanding bomb</b> (for explosion or reactivity hazards)		<b>Flame</b> (for fire hazards)		<b>Flame over circle</b> (for oxidizing hazards)
	<b>Gas cylinder</b> (for gases under pressure)		<b>Corrosion</b> (for corrosive damage to metals, as well as skin, eyes)		<b>Skull and Crossbones</b> (can cause death or toxicity with short exposure to small amounts)
	<b>Health hazard</b> (may cause or suspected of causing serious health effects)		<b>Exclamation mark</b> (may cause less serious health effects or damage the ozone layer*)		<b>Environment*</b> (may cause damage to the aquatic environment)
					
<b>Biohazardous Infectious Materials</b> (for organisms or toxins that can cause diseases in people or animals)					

\* The GHS system also defines an Environmental hazards group. This group (and its classes) was not adopted in WHMIS 2015. However, you may see the environmental classes listed on labels and Safety Data Sheets (SDSs), including information about environmental hazards is allowed by WHMIS 2015.

Harmonized System of Classification and Labeling of Chemicals (GHS). EPA's proposal also seeks to align regulations governing significant new uses of chemical substances with changes to OSHA's respiratory protection standard and NIOSH respirator certification requirements regarding the protection of workers from chemical exposure. Manufacturers and processors of chemical substances are among those who would be potentially affected by this action.

A rule proposed by EPA would update and align existing regulations that govern significant new uses of chemical substances under the Toxic Substances Control Act (TSCA) with revisions to OSHA's Hazard Communication (HazCom) Standard. The revised HazCom Standard, which was released in March 2012, aligned OSHA's standard with the United Nations' Globally

*Read more:*

<https://www.aiha.org/publications-and-resources/TheSynergist/Industry%20News/Pages/EPA-Proposal-Seeks-Alignment-with-OSHA,-NIOSH-Regulations-and-GHS.aspx>

**OSHA**

## OSHA, Health Canada Update Plan to Align Labeling, Classification for Hazardous Chemicals

OSHA and Health Canada, through the Regulatory Cooperation Council, have developed a 2016-2017 Workplace Chemicals Work Plan. The purpose of the work plan is to ensure that current and future requirements for classifying and



# Army Industrial Hygiene News and Regulatory Summary

communicating the hazards of workplace chemicals will be acceptable in the United States and Canada without reducing worker safety.

Read more:

<http://ehstoday.com/ghs/osha-health-canada-update-plan-align-labeling-classification-hazardous-chemicals>

**NIOSH**

## Anesthesiology Care Providers Follow Some, But Not All Safety Practices



issue of the *Journal of Occupational and Environmental Hygiene* and is currently available online.

For example, scavenging systems – equipment used to prevent waste anesthetic gases from escaping into the operating room – are widely used, but other recommended practices to minimize exposure are not always followed. Among the report’s other findings:

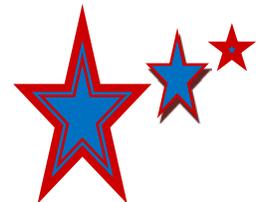
A new study from the National Institute for Occupational Safety and Health (NIOSH) has found that anesthesia care providers have a mixed record of following safety recommendations to limit occupational exposure to waste anesthetic gases. This study was published in the October 2016

Read more:

<http://www.mdlinx.com/anesthesiology/washington-report/2016/10/06/6890868>

**APHC**

## September DOEHRs-IH SUPER STARS



**Congratulations to Fort Knox** for restructuring SEGs using the Army’s Business Practice. Their revision now has SEGs based on, and named after a DOEHRs-

IH common process, thereby avoiding the mistake of mismatched process methods and micro-SEGs based on buildings.

# Army Industrial Hygiene News and Regulatory Summary

Congratulations to Fort Leavenworth for the extra focus on establishing a DOEHRS

tree that has every building represented.

## Training

### Upcoming Training

#### What's new with Army IH Training?



**This month's featured self-development material on blackboard:**

- Ionizing and Non-Ionizing Radiation Sources in the Medical Environment(1.25hrs)
- Hazard Communications (HAZCOM 1.0hrs)
- Industrial Workplace Ergonomics for DOEHRS-IH Users (Intermediate 0.5hr)
- 2016 HAZWOPER 8hr Refresher (limited time offer!)
- DOEHRS-IH Army Business Practice (1.0hr)
- Self-enroll at <https://aiphdohs.elic.learn.army.mil>

**Face to Face Training Opportunities:**

- May 8-12, 2017 Blueprint Reading & Design Review (APG, MD)
- May 15-19, Intermediate Industrial Hygiene Topics Course (APG, MD)
- May 22-26 Industrial Ventilation 40hr Course (APG, MD)
- Self-enroll at <https://aiphdohs.elic.learn.army.mil>

**LIVE Manage Your IH Monster Webinars: 210-249-4234 or DSN 421-3272 (overseas DSN 312)**

- Sept 13<sup>th</sup> 1800 & 14<sup>th</sup> 0700 EST -De-Mystifying the Metrics Code: 68461#
- Nov 1<sup>st</sup> 1800 & 2<sup>nd</sup> 0700 EST -All About ANOVA Code: 14338#
- Jan (2017) 11<sup>th</sup> 1800 & 12<sup>th</sup> 0700 EST -Business Objects At It's Best
- Mar (2017) 14<sup>th</sup> 1800 & 15<sup>th</sup> 0700 EST -Magic of Medical Surveillance

**Registration & Recordings Currently Available at [aiph-dohs.elic.learn.army.mil](https://aiph-dohs.elic.learn.army.mil):**

- Lab Interfaces
- Taming That SHOP Monster
- Cancer in the Military
- Taming The SEG Monster
- Don't Be Afraid of The Big Bad Budget

**Other FREE Training Opportunities:**

- AIHA CIH Prep Webinars email: [mrupert@sevengenhse.com](mailto:mrupert@sevengenhse.com) to register.
  - Recordings are available
- AIHA HPECC Webinars (Time: 2-3pm ET 1-800-768-2983 Code: 9567345 <https://www.callinfo.com/prt?host=level3&an=8007682983&ac=9567345>)
  - November 10 Expedient Engineering Controls for Epidemics and Terrorism Events
  - January 12 Direct Reading Instruments for the Practicing IH
  - March 9, 2017 Computational Fluid Dynamics, Can It Truly Benefit the Industrial Hygienist or is It Just Colorful Fluid Dynamics?
  - Recordings are available upon request email

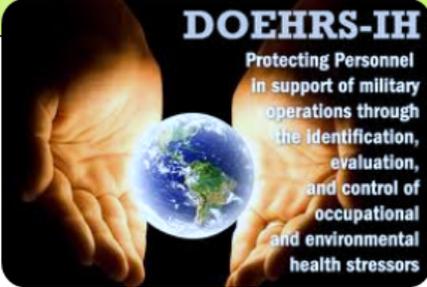


Important  
Announcements!

- DOEHS-IH Demo website is down until Nov 30!
- Army Blackboard has not accepted AKO email for over a year. Users with AKO emails will be deleted from rosters. Certificates cannot be generated for AKO emails. If you are enrolling in PHC Blackboard courses make sure you have updated your email. Instructions for updating email are available at [aph-dohs.ellc.learn.army.mil](http://aph-dohs.ellc.learn.army.mil)
- Supervisors of Intermediate Industrial Hygiene students: be cognizant that students require time to complete the very rigorous online portion and students should be approximately 50% complete with the online portion at this time.
- If you are not viewing the Manage Your IH Monster Webinars you are missing important information about Army IH Practices! Recordings are available on Blackboard.
- LAST CALL: the 2016 HAZWOPER 8 hour Refresher course window will close soon. If you need this course to maintain your certification don't wait to enroll and complete this on our Blackboard.

# Army Industrial Hygiene News and Regulatory Summary

## DOEHRS-IH Training



### What's new with Army DOEHRS-IH?

### Face to Face Training Opportunities:

- Dec 12-16 Army DOEHRS-IH Initial (APG, MD bldg. 6008 3 seats remaining)
- Self-enroll at <https://aiphdohs.ellc.learn.army.mil> code: 2016

### DOEHRS-IH Super Stars:

- **Congratulations to Fort Knox** for restructuring SEGs using the Army's Business Practice. Their revision now has SEGs based on and named after a DOEHRS-IH common process, thereby avoiding the mistake of mismatched process methods and micro-SEGs based on building.
  - Vehicle maintenance, multiple operations (2942 B, Colby Motorpool, HHC Maintenance, 11th TAC)
  - Vehicle maintenance, multiple operations (6145, Potts Motorpool, TTC Knox)
  - Vehicle maintenance, multiple operations (5901, Maintenance, 81st RSC, ECS63)
  - Vehicle maintenance, multiple operations (2942 A, Colby Motorpool, 8-229th, 11th TAC)



[Building 469](#)

- Hazardous Gas Response (469, Fire Station #1 HQ, Fire Dept., DES)
- Filling SCBA Tanks (469, Fire Station #1 HQ, Fire Dept., DES)
- Permit Required Confined Space Entry Response (469, Fire Station #1 HQ, Fire Dept., DES)
- Firefighting Training (469, Fire Station #1 HQ, Fire Dept., DES)
- Protective Services, Fire (Airfield Response) (469, Fire Station #1 HQ, Fire Dept., DES)
- Swift Water Rescue (469, Fire Station #1 HQ, Fire Dept., DES)
- Vehicle Extraction (469, Fire Station #1 HQ, Fire Dept., DES)
- Lawn Maintenance (469, Fire Station #1 HQ, Fire Dept., DES)
- Firefighting (469, Fire Station #1 HQ, Fire Dept., DES)
- High/Low Angle Rescue (469, Fire Station #1 HQ, Fire Dept., DES)
- Administrative, NOC (469, Fire Station #1 HQ, Fire Dept., DES)
- Protective Services, Fire (Special Rescue Operations) (469, Fire Station #1 HQ, Fire Dept., DES)
- Respirator Fit Testing (469, Fire Station #1 HQ, Fire Dept., DES)
- Wildland Fire Response (469, Fire Station #1 HQ, Fire Dept., DES)

- **Congratulations to Fort Leavenworth** for the extra focus on establishing a DOEHRS tree that has every building represented.



# Army Industrial Hygiene News and Regulatory Summary

This monthly summary is published by the Industrial Hygiene and Medical Safety Management Program (IHMSMP) for the Army Public Health Center



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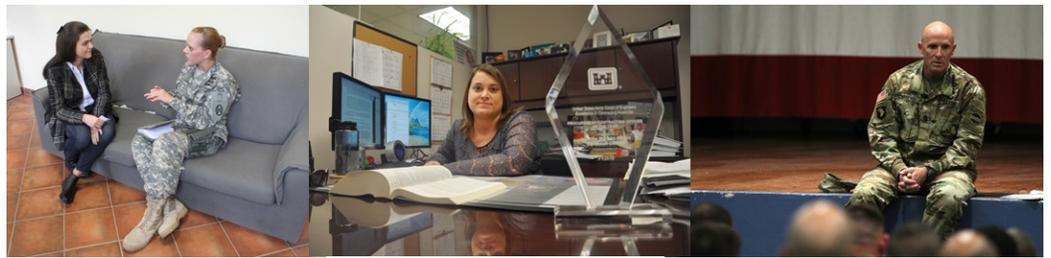
### By Phone or FAX:

Office: (410) 436-3161

FAX: (410) 436-8795

### On the Web:

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



## Professional Development and Career Programs

For Army Industrial Hygienists and Industrial Hygiene Technicians, Professional Development is through the Army Safety and Occupational Health (SOH) Career Program, known as Career Program 12 (CP-12).

Career Programs were established to ensure there is an adequate base of qualified and trained professional, technical, and administrative personnel to meet the Army's current and future needs.

Planned training and development are essential elements to building a successful career.

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