

Hazardous Substances

Special Interest Articles:

- [Cadmium](#)
- [Zika](#)
- [Safety Breaks](#)
- [Career Stages](#)
- [Blackboard Certificates](#)

DOEHRS Super Star

A Scourge Returns: Black Lung in Appalachia

Once a month, a group of men in t-shirts, jeans, and baseball caps gather around a long table at the New River Health Clinic. The clinic, a small, one-story yellow clapboard building, is located in the tiny town of Scarbro, nestled in the bituminous hills of southern West Virginia. The members of the Fayette County Black Lung Association greet each other by name while they pour bitter black coffee into small Styrofoam cups.

Amidst the chatter and the coffee are the coughs. Some of the men hack loudly, others more quietly. All of them have advanced black lung, a disease they acquired working in the local mines. Although roughly 22% of underground miners smoke, 1 compared with about 18% of U.S. adults in general, 2 none of these men do. They gather not just as a support group but also to help one another complete the stacks of paperwork necessary to apply for government-mandated benefits for black lung and navigate the tortuous appeals process.

black lung benefits

coal miners

who are disabled by coal dust disease

and widows

of coal miners who had this disease

may now receive black lung cash benefits under the new Federal Coal Mine Health and Safety Act.

If you think you may be entitled to these monthly benefits and have not already applied, do it now at any social security office.



U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Social Security Administration

MARCH 1970

50-418

Read more:

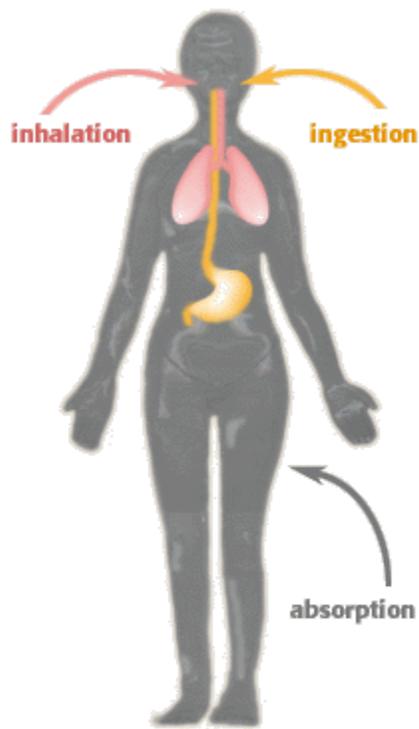
<http://ehp.niehs.nih.gov/124-A13/>

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What Can Epidemiological Studies Tell Us about the Impact of Chemical Mixtures on Human Health?



Humans are exposed to a large number of environmental chemicals: Some of these may be toxic, and many others have unknown or poorly characterized health effects. There is intense interest in determining the impact of exposure to environmental chemical mixtures on human health. As the study of mixtures continues to evolve in the field of environmental epidemiology, it is imperative that we understand the

methodologic challenges of this research and the types of questions we can address using epidemiological data. In this article, we summarize some of the unique challenges in exposure assessment, statistical methods, and methodology that epidemiologists face in addressing chemical mixtures. We propose three broad questions that epidemiological studies can address: a) What are the potential health impacts of individual chemical agents? b) What is the interaction among agents? And c) what are the health effects of cumulative exposure to multiple agents? As the field of mixtures research grows, we can use these three questions as a basis for defining our research questions and for developing methods that will help us better understand the effect of chemical exposures on human disease and well-being.

Read more:
<http://ehp.niehs.nih.gov/15-10569/>



Tests Suggest Mercury in Air at Some Dental Clinics

Alex Hummell says few dentists seem worried enough about invisible, odorless mercury to take the kinds of precautions needed to prevent everyday exposures.

As the head of a Littleton, Colorado, firm that sells sophisticated equipment to gauge airborne levels of highly toxic mercury at industrial sites worldwide, Hummell has watched manufacturers of all sorts put their employees through strict training programs in which they don special equipment to avoid even tiny exposures.

Then he walks into dental clinics and is dumbfounded. On numerous occasions, he said, he has detected mercury levels in dental offices that were two to three times the average workday exposure limit of 100

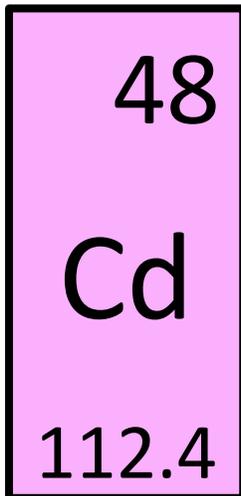


micrograms per cubic meter set by the OSHA, but patients and the staff were wearing little or no protective equipment.

Read more:

<http://www.kansascity.com/latest-news/article53122320.html>

Confusion about Cadmium Risks: The Unrecognized Limitations of an Extrapolated Paradigm



Background: Cadmium (Cd) risk assessment presently relies on tubular proteinuria as a critical effect and urinary Cd (U-Cd) as an index of the Cd body burden. Based on this paradigm, regulatory bodies have reached contradictory conclusions regarding the safety of Cd in food.

Adding to the confusion, epidemiological studies implicate environmental Cd as a risk

factor for bone, cardiovascular, and other degenerative diseases at exposure levels that are much lower than points of departure used for setting food standards.

Objective: The objective was to examine whether the present confusion over Cd risks is not related to conceptual or methodological problems.

Discussion: The cornerstone of Cd risk assessment is the assumption that U-Cd reflects the lifetime accumulation of the metal in the body. The validity of this assumption as applied to the general

population has been questioned by recent studies revealing that low-level U-Cd varies widely within and between individuals depending on urinary flow, urine collection protocol, and recent exposure. There is also evidence that low-level U-Cd increases with proteinuria and essential element deficiencies, two potential confounders that might explain the multiple associations of U-Cd with common degenerative diseases. In essence, the present Cd confusion might arise from the fact that this heavy metal follows the same transport pathways as plasma proteins for its urinary excretion and the same transport pathways as

essential elements for its intestinal absorption.

Conclusions: The Cd risk assessment paradigm needs to be rethought taking into consideration that low-level U-Cd is strongly influenced by renal physiology, recent exposure, and factors linked to studied outcomes.

Read more:

<http://ehp.niehs.nih.gov/1509691/>

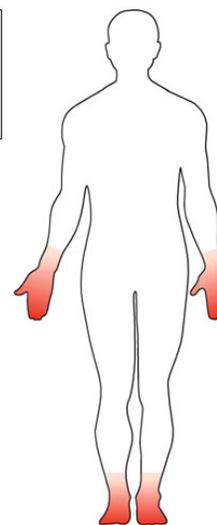
Chronic Exposure to Arsenic and Markers of Cardiometabolic Risk: A Cross-Sectional Study in Chihuahua, Mexico

Background: Exposure to arsenic (As) concentrations in drinking water > 150 µg/L has been associated with risk of diabetes and cardiovascular disease, but little is known about the effects of lower exposures.

Objective: This study aimed to examine whether moderate As exposure, or indicators of individual As metabolism at these levels of exposure, are associated with cardiometabolic risk.

Methods: We analyzed cross-sectional associations between arsenic exposure and multiple markers of cardiometabolic risk using drinking-water As measurements and urinary As species data obtained from 1,160 adults in Chihuahua, Mexico, who were recruited in 2008–2013. Fasting blood glucose and lipid levels, the results of an

The most common neurologic effect of chronic arsenic intoxication is a sensory-predominant peripheral neuropathy in a "stocking-glove" pattern, as shown in the diagram to the right.



oral glucose tolerance test, and blood pressure were used to characterize cardiometabolic risk. Multivariable logistic, multinomial, and linear regression were used to assess associations between cardiometabolic outcomes and water As or

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the sum of inorganic and methylated As species in urine.

Results: After multivariable adjustment, concentrations in the second quartile of water As (25.5 to < 47.9 µg/L) and concentrations of total speciated urinary As (< 55.8 µg/L) below the median were significantly associated with elevated triglycerides, high total cholesterol, and diabetes. However, moderate water and urinary As levels were also positively associated with HDL cholesterol.

Associations between arsenic exposure and both dysglycemia and triglyceridemia were

higher among individuals with higher proportions of dimethylarsenic in urine.

Conclusions: Moderate exposure to As may increase cardiometabolic risk, particularly in individuals with high proportions of urinary dimethylarsenic. In this cohort, As exposure was associated with several markers of increased cardiometabolic risk (diabetes, triglyceridemia, and cholesterolemia), but exposure was also associated with higher rather than lower HDL cholesterol.

Read more:

<http://ehp.niehs.nih.gov/1408742/>

Development of the Chemical Exposure Monitor with Indoor Positioning (CEMWIP) for Workplace VOC Surveys



The purpose of this project was to research and develop a direct-reading exposure assessment method that combined a real-time location system with a wireless direct-reading personal chemical sensor. The personal chemical sensor was a photoionization device for detecting volatile organic compounds. The combined system was calibrated and tested against the same

four standard gas concentrations and calibrated at one standard location and tested at four locations that included the standard locations. Data were wirelessly collected from the chemical sensor every 1.4 seconds, for volatile organic compounds concentration, location, temperature, humidity, and time. Regression analysis of the photo-ionization device voltage response against calibration gases showed the chemical sensor had a limit of detection of 0.2 ppm. The real-time location system was accurate to $13 \text{ cm} \pm 6 \text{ cm}$ (standard deviation) in an open area and to $57 \text{ cm} \pm 31 \text{ cm}$ in a closed room where the radio frequency has to penetrate drywall-finished walls. The resulting data were collected and graphically displayed as a three-dimensional hazard map for assessment of peak

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exposure with location. A real-time personal exposure assessment device with indoor positioning was practical and provided new knowledge on direct reading exposure assessment methods..

Read more: Journal of Occupational and Environmental Hygiene Accepted author version posted online: 19 Jan 2016 (Available with AIHA membership)

Alcohol in E-Cigs Can Affect Motor Skills

Some commercially available e-cigarettes contain enough alcohol to impact motor skills, a new Yale University School of Medicine study shows.

E-cigarettes deliver nicotine by vaporizing liquids, which often contain alcohol and other chemicals in addition to nicotine. In the new study, published in the journal Drug and Alcohol Dependence, researchers tested subjects who used two commercially available e-cigarettes with liquids containing either high (23.5%) or low (0.4%) amounts of alcohol.

While neither group reported feeling differently after inhaling vapor, the group who used e-cigarettes with the high alcohol level performed more poorly on psychomotor tests and in some instances



also had detectable levels of alcohol in their urine.

Read more:

<http://www.healthnewsdigest.com/news/smoking%20issues0/Alcohol-in-e-cigs-Can-Affect-Motor-Skills.shtml>

Radiation

Test Your Home for Radon, You May Prevent Lung Cancer



January is National Radon Action Month and the U.S. Environmental Protection Agency (EPA) encourages Americans around the country to test their homes for radon,

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the second leading cause of lung cancer. Make 2016 a healthier, safer new year by testing your home.

Each year about 21,000 Americans die from lung cancer caused by exposure to radon. Testing is the only way to know if your home has an elevated level of radon. The U.S. Surgeon General and EPA recommend taking action to fix your home if the radon level is 4 picocuries per Liter (pCi/L) of air or

more. You should contact a qualified radon mitigation contractor if your test result is 4 pCi/L or more.

Read more:

<http://yosemite.epa.gov/opa/admpress.nsf/d02490a60ecbb12285257f32005cc13a/529e9220c18371da85257f3b0051a595!OpenDocument>

Report Underlines Recent Worker Hazards at Old Weapons Plants

The toxic morass that was America's nuclear weapons complex is no secret. Hazardous conditions in places like the Portsmouth Gaseous Diffusion Plant in Ohio moved Congress in 2000 to create a compensation program for former workers who developed illnesses that may have been caused by radiation or chemical exposures.

The program, run by the U.S. Department of Labor, assumes that conditions significantly improved at nuclear sites after 1995 and processes claims accordingly. A new report by federal health investigators, however, casts doubt on that assumption



Read more:

<http://www.publicintegrity.org/2016/01/07/19113/report-underlines-recent-worker-hazards-old-weapons-plants>

Ventilation

Hexavalent Chromium and Isocyanate Exposures during Military Aircraft Painting under Crossflow Ventilation



Exposure control systems performance was investigated in an aircraft painting hangar. The ability of the ventilation system and respiratory protection program to limit worker exposures was examined through air sampling during painting of F/A-18C/D strike fighter aircraft, in four field surveys. Air velocities were measured across the supply filter, exhaust filter, and hangar midplane under crossflow ventilation. Air sampling conducted during painting process phases (wipe-down, primer spraying, and topcoat spraying) encompassed volatile organic compounds, total particulate matter, Cr[VI], metals, nitroethane, and hexamethylene diisocyanate, for two worker groups: sprayers and sprayer helpers (“hosemen”). One of six methyl ethyl ketone and two of six methyl isobutyl ketone samples exceeded the short term exposure limits of 300 and 75 ppm, with means 57 ppm and 63 ppm, respectively. All

12 Cr[VI] 8-hr time-weighted averages exceeded the recommended exposure limit of $1 \mu\text{g}/\text{m}^3$, 11 out of 12 exceeded the permissible exposure limit of $5 \mu\text{g}/\text{m}^3$, and 7 out of 12 exceeded the threshold limit value of $10 \mu\text{g}/\text{m}^3$, with means $38 \mu\text{g}/\text{m}^3$ for sprayers and $8.3 \mu\text{g}/\text{m}^3$ for hosemen. Hexamethylene diisocyanate means were $5.95 \mu\text{g}/\text{m}^3$ for sprayers and $0.645 \mu\text{g}/\text{m}^3$ for hosemen. Total reactive isocyanate group—the total of monomer and oligomer as NCO group mass—showed six of 15 personal samples exceeded the United Kingdom Health and Safety Executive workplace exposure limit of $20 \mu\text{g}/\text{m}^3$, with means $50.9 \mu\text{g}/\text{m}^3$ for sprayers and $7.29 \mu\text{g}/\text{m}^3$ for hosemen. Several exposure limits were exceeded, reinforcing continued use of personal protective equipment. The supply rate, $94.4 \text{ m}^3/\text{s}$ (200,000 cfm), produced a velocity of 8.58 m/s (157 fpm) at the supply filter, while the exhaust rate, $68.7 \text{ m}^3/\text{s}$ (146,000 cfm), drew 1.34 m/s (264 fpm) at the exhaust filter. Midway between supply and exhaust locations, the velocity was 0.528 m/s (104 fpm). Supply rate exceeding exhaust rate created re-circulations, turbulence, and fugitive emissions, while wasting energy. Smoke releases showing more effective ventilation here than in other aircraft painting facilities carries technical feasibility relevance.

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

version posted online: 23 Dec 2015
(Available with AIHA membership)

PPE

A Method for Evaluating Aerosol Leakage through the Interface between Protective Suits and Full Face Respirators

Military personnel and first responders use a range of personal equipment including protective suits, gloves, boots and respirators to prevent exposure of their skin and airways to hazardous chemical, biological, radiological and/or nuclear substances. Although each individual item of personal protective equipment is well tested against existing standards, it is also necessary to consider the performance of the interfaces between items in terms of prevention from exposure, and the protection system as a whole. This paper presents an aerosol challenge method for assessing the performance of the interface between a respirator and the hood of a protective suit. The interface is formed between the sealing strip of the hood and the surface of the respirator's outer sealing area and is affected by how well the sealing strip can cover and adapt to the sealing area. The method evaluates the leakage of particles of different sizes into the hood via the interface by particle counting at sampling points around the respirator's perimeter. Three different respirators were tested together with a single hood having a tight-fitting seal. The method variation between measurements was low but increased appreciably when the protective

ORI MOVING THROUGH THE MOPP LEVELS

FOR MORE INFORMATION: AIRMAN'S MANUAL, PAGES 21-33

INSIDE YOUR BAG
FIELD GEAR: web belt, canteen & cup holder, boot bearing thermos, body warmer (if needed).
OVERGARMENT: suitable dress overgarment, chemical protective overgarment (formerly 22/02) or hood liner/liner integrated Respirator Ensemble.
FOOTWEAR: green or black swivels, or multipurpose lightweight combat.
MASK HOOD: protective mask with 22 series canister or filter elements and hood attached (if wearing 800) and second skin.
HANDWEAR: protective gloves and cotton inserts.
 ALSO: M8 and M9 paper decontamination kits.

QUICK MOPP	MOPP 0	MOPP 1	MOPP 2	MOPP 3	MOPP 4
FIELD GEAR	WORN	WORN	WORN	WORN	WORN
OVERGARMENT	CARRIED	WORN	WORN	WORN	WORN
FOOTWEAR	CARRIED	CARRIED	WORN	WORN	WORN
MASK HOOD	CARRIED	CARRIED	WORN	WORN	WORN
HANDWEAR	CARRIED	CARRIED	CARRIED	CARRIED	WORN

IMPORTANT NOTE:
 THERE IS NO LONGER A RECURRING REQUIREMENT FOR GAS MASK FIT TESTING.
 TESTING IS ONLY REQUIRED TO BE REIMPLEMENTED FOR CHANGES IN SIZE OR TYPE OF MASK, GAINS OR LOSSES OF 10 PERCENT BODY WEIGHT, OR SIGNIFICANT FACIAL CHANGES.
 Source: AFHS/DSD 48-137_312, Respiratory Protection Program

HYDRATE, HYDRATE, HYDRATE
 Wearing PPE increases your need to hydrate. Practice drinking through the mask's tube to ensure you don't become a casualty to the heat:
 - Decontaminates surfaces if in potentially contaminated environment.
 - Remove drinking tube while securing mask to face to maintain seal.
 - Blow through tube while inserting into cup until resistance is felt.
 - Tip canteen above head and drink - repeat to continue drinking.
 - When done, blow while disconnecting and returning tube. Close canteen.
 ALWAYS USE BUDDY SYSTEM WHEN AVAILABLE.

ensemble was re-dressed between measurements. This demonstrates the difficulty of achieving a reliable and reproducible seal between respirator and hood under normal conditions. Different leakage patterns were observed for the three respirators and were linked to some specific design features, namely the respirator's sealing area at the chin and its width at cheek level. Induced leak experiments showed that to detect substantial particle leakage, channels at the hood-respirator interface must be quite large. The method outlined herein provides

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a straightforward way of evaluating hood-respirator interfaces and could be useful in the further development of personal protective equipment.

Read more: Journal of Occupational and Environmental Hygiene Accepted author version posted online: 22 Dec 2015 (Available with AIHA membership)

NIOSH Updates Software for Estimating Service Lives of Respirator Cartridges



NIOSH has updated its “MultiVapor” computer software for estimating breakthrough times and service lives of air-purifying respirator cartridges, larger filters, and carbon beds of any size prepared for laboratory studies. The update adds 66 new compounds, including toluene diisocyanate (TDI), methylene bisphenyl isocyanate (MDI), and Styrene, to the software’s library. According to NIOSH, the updated version also features typical organic vapor

(OV) cartridge parameters that are more representative of commonly used cartridges.

MultiVapor is intended to help industrial hygienists or other qualified persons set cartridge change-out schedules. NIOSH states that the software should not be used as a substitute for regulatory requirements or professional judgments.

Read more:

<https://www.aiha.org/publications-and-resources/TheSynergist/Industry%20News/Pages/NIOSH-Updates-Software-for-Estimating-Service-Lives-of-Respirator-Cartridges.aspx>

Predicting Future Protection of Respirator Users: Statistical Approaches and Practical Implications

PURPOSE: To describe a statistical approach to predicting a respirator user's fit factor in the future based upon results from initial tests. **METHODS:** A statistical prediction model was developed based upon joint distribution of multiple fit factor measurements over time obtained from linear mixed effect models. The model



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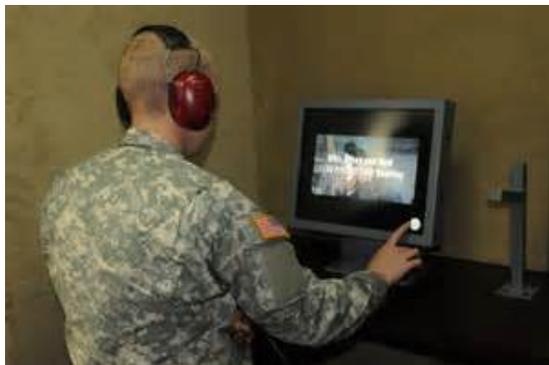
accounts for within-subject correlation as well as short-term (within one day) and longer-term variability. As an example of applying this approach, model parameters were estimated from a research study in which volunteers were trained by three different modalities to use one of two types of respirators. They underwent two quantitative fit tests at the initial session and two on the same day approximately 6 months later. RESULTS: The fitted models demonstrated correlation and gave the estimated distribution of future fit test results conditional on past results for an individual worker.

CONCLUSIONS/IMPLICATIONS: This approach can be applied to (1) establishing a criterion value for passing an initial fit test to provide reasonable likelihood that a worker will be adequately protected in the future; (2) optimizing the repeat fit factor test intervals individually for each user for cost-effective testing.

Read more: Journal of Occupational and Environmental Hygiene Accepted author version posted online: 15 Jan 2016 (Available with AIHA membership)

Noise

Prevalence of Permanent Threshold Shifts in the United States Air Force Hearing Conservation Program by Career Field, 2005-2011



The purpose of this study was to describe changes in hearing, using the permanent threshold shift metric, among United States Air Force servicemembers, including active duty, Reserve and Air National Guard components, for demographics, job categories, and career fields. In the United States Air Force, only servicemembers who

are occupationally exposed routinely to hazardous noise are monitored. Audiogram records and demographic variables were analyzed for servicemembers from 2005 to 2011 using data from the Department of Defense system that captures occupational hearing tests worldwide. Results suggest that occupational hearing loss was larger in males than females, in officers than enlisted populations, and in Reserve and Air National Guard than in active duty. Compared to similar civilian career fields, active duty has lower prevalence rates for occupational hearing loss overall, although Reserve and Air National Guard prevalence rates were more similar to the civilian reported rates. The proportion of personnel with permanent threshold shifts varied

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between 4.6 - 16.7% within active duty career fields, which includes 76% of the population for study timeframe. Permanent threshold shift was larger in small job categories, and in jobs that are not considered exposed to hazardous noise routinely which is comparative with results from civilian data analysis of occupational hearing loss. Further investigation into testing practices for Air Force specific groups, use of the system for non-occupational hearing testing, and challenges to follow-up compliance is warranted. Increased surveillance

procedures for occupational hearing loss are needed to address concerns on the prevalence of servicemember hearing loss, the role of recreational and lifestyle factors to contribute the high reported hearing loss prevalence of veterans compared to non-veterans.

Read more: Journal of Occupational and Environmental Hygiene Accepted author version posted online: 31 Dec 2015 (Available with AIHA membership)

Preventive Medicine

How to Avoid Airport Germs While Traveling

According to the CDC, there are 1 billion people who travel by commercial aircraft in the world each year. That number is expected to double within the next 20 years. While air travel may get us where we need to go at a faster pace, it can also wreak havoc on our bodies, with healthy travelers picking up germs that make them sick in the days that follow their flight. As we make our way through the airport and sit on the plane, we just don't usually think about all of the germs that are there," explains Tina Aldatz, chief executive officer of travel wellness company Savvy Travelers. "The problem is that they are all over the place and some of them will ruin your travel plans if you come in contact with them."

Many people have concerns about the recirculated air in planes, but the CDC reports that in most newer model airplanes,

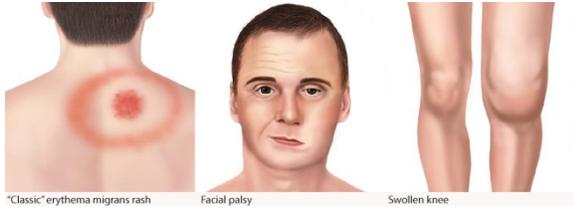


the recycled air passes through high-efficiency filters that remove 99.9 % of the bacteria and virus particles. They report that some illnesses are spread through touching contaminated surfaces. The good news is that there are things people can do to try and minimize their exposure to the germs and bacteria, which could leave them sick. Here are some tips for avoiding airport germs while traveling:

Read more:

<http://www.healthnewsdigest.com/news/Travel-350/How-to-Avoid-Airport-Germs-While-Traveling.shtml>

Ticks Carry Lyme Disease in Almost Half of U.S. Counties



Ticks that can spread Lyme disease now live in almost half of U.S. counties, according to a new study from the Centers for Disease Control and Prevention.

Varieties of the blacklegged tick that may carry *Borrelia burgdorferi* responsible for Lyme disease are present in 45% of counties nationwide, compared with just 30% in 1998, researchers found.

Read more: Journal of Occupational and Environmental Hygiene Accepted author version posted online: 31 Dec 2015 (Available with AIHA membership)

CDC Notes Zika-Microcephaly Link, Ponders Travel Alert

The US Centers for Disease Control and Prevention (CDC) yesterday presented perhaps its most compelling evidence for a link between Zika virus infection and microcephaly, a condition of small heads and brains that has risen 10-fold in Brazil as Zika infections there have spiked, according to media reports.

The CDC is also considering warning pregnant women not to travel to Zika-affected countries, officials said.

And in related news, two National Institutes of Health (NIH) experts wrote in the *New England Journal of Medicine* (NEJM) yesterday that the disease presents yet another facet of the growing threat of mosquito-borne diseases to North America.



Read more:
<http://www.cidrap.umn.edu/news-perspective/2016/01/cdc-notes-zika-microcephaly-link-ponders-travel-alert>

No Simple Fix: Infrastructure, Health Issues Loom Large In Flint Water Crisis



What will it take to fix the water crisis in Flint, Michigan?

Most likely, the answer will be a combination of science to clean up the

water, costly infrastructure upgrades to replace dangerous pipes, and in-depth investigations to prevent it from happening again. Then there's the serious matter of addressing the long-term health implications of exposing thousands of children to dangerously high levels of lead.

What's happened already and what still needs to happen prove that there is no simple fix.

Read more:

<http://edition.cnn.com/2016/01/19/us/flint-water-crisis-whats-next/index.html>

500 Kinds of Bugs May be Living in Your House

Spiders, flies, beetles, and book lice are among the surprisingly plentiful critters detected in a new survey of U.S. homes.

Forget the rain forest—your home is brimming with bugs. More than 500 kinds of them.

Spiders, flies, beetles, ants, and book lice are among the critters detected in a new study, the first to evaluate arthropod diversity in U.S. homes.

Arthropods—a huge group that includes insects, spiders, and their relatives—have



been living and evolving alongside people for millennia.

Read more:

<http://news.nationalgeographic.com/2016/01/160119-insects-spiders-bugs-homes-science-animals/>

Five Viruses Are Known Human Carcinogens, Say NTP Peer Reviewers



A panel of experts agreed with the National Toxicology Program (NTP) preliminary recommendations to list five viruses as known to be human carcinogens in the Report on Carcinogens (RoC). All five listings are based on sufficient evidence from human studies associating these viral

infections with an increased risk of 1 to 10 different cancers, depending on the virus.

The panel at the December 17 meeting was charged with reviewing the five draft monographs and voting on whether the scientific evidence supported the NTP listing recommendation for each virus. Before the formal presentations for each virus began, Ruth Lunn, Dr.P.H., director of the Office of the RoC, gave an overview of the RoC process, which provides for scientific, public, and peer review input.

Read more:

<http://www.niehs.nih.gov/news/newsletter/2016/1/science-highlights/virus/index.htm>

First Clue to Treating Mystery Disease of US Pacific Island

The Chamorro people of the Pacific island of Guam know it as lytigo-bodig. For decades, they have been struck down by a mysterious illness that resembles the muscle-wasting disease amyotrophic lateral sclerosis (ALS), Parkinson's disease and Alzheimer's-like dementia. It now looks like we have a clue that could point to a way of slowing its development.

Lytigo-bodig is a progressive disease. ALS symptoms arrive when people are in their mid-40s and early 50s. By the time they reach their 60s, they also have the shaking and lack of coordination that characterises Parkinson's, before the cognitive problems



associated with dementia also set in. "Initially they stumble a bit, but as their muscles wither, they need help with eating

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and going to the toilet, as well as having difficulty swallowing and breathing,” says Paul Cox of the Institute for Ethnomedicine in Wyoming.

For a long time, a chemical called BMAA, found in the cycad seeds that the Chamorro grind up to make flour, has been suspected as the cause of the disease. The toxin builds up in the cyanobacteria that grow in the

roots of cycad plants. It also accumulates in the tissue of seed-eating flying foxes, which the Chamorro hunt and eat.

Read more:

<https://www.newscientist.com/article/2073942-first-clue-to-treating-mystery-disease-of-us-pacific-island/>

Environmental Health

U.S. Funds Solar Panel Pavement That Generates Power



A new type of solar pavement that can generate electricity and send it to the power grid is being developed by the U.S. company Solar Roadways, with funding from the federal government say Michael

Trentacoste and Robert Johns of the U.S. Department of Transportation.

Trentacoste is associate administrator of the Federal Highway Administration’s Office of Research, Development, and Technology. Johns is director of Volpe, the National Transportation Systems Center.

Read more <http://ens-newswire.com/2016/01/11/u-s-funds-solar-panel-pavement-that-generates-power/>

Evidence from Toxicology: The Most Essential Science for Prevention

Background: The most essential goal of medicine and public health is to prevent harm (primum non nocere). This goal is only fully achieved with primary prevention,

which requires us to identify and prevent harms prior to human exposure through research and testing that does not involve human subjects. For that reason, public

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health policies place considerable reliance on nonhuman toxicological studies. However, toxicology as a field has often not produced efficient and timely evidence for decision making in public health. In response to this, the U.S. National Research Council called for the adoption of evidence-based methods and systematic reviews in regulatory decision making. The U.S. EPA, the FDA, and the European Food Safety Agency (EFSA) have recently endorsed these methods in their assessments of safety and risk.

Objectives: In this commentary we summarize challenges and problems in current practices in toxicology as applied to decision making. We compare these practices with the principles and methods utilized in evidence-based medicine and health care, with emphasis on the record of the Cochrane Collaboration.

Discussion: We propose a stepwise strategy to support the development, validation, and application of evidence-based toxicology (EBT). We discuss current progresses in this field produced by the Office of Health Assessment and Translation (OHAT) of the National Toxicology Program and the

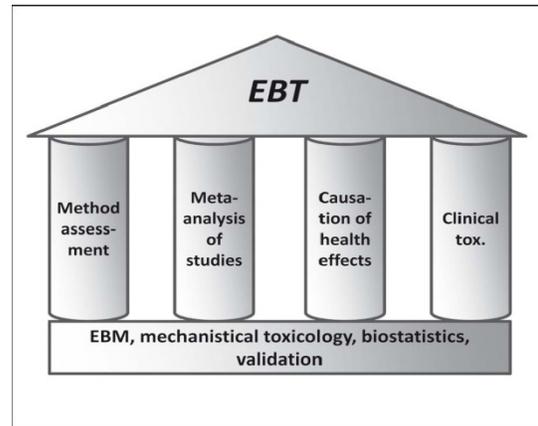


Fig. 1: Building the “temple” of Evidence-based Toxicology Navigation Guide works. We propose that adherence to the Cochrane principles is a fundamental prerequisite for the development and implementation of EBT.

Conclusion: The adoption of evidence-based principles and methods will enhance the validity, transparency, efficiency, and acceptance of toxicological evidence, with benefits in terms of reducing delays and costs for all stakeholders (researchers, consumers, regulators, and industry).

Read more:

<http://ehp.niehs.nih.gov/1509880/>

Odors from Porter Ranch Gas Leak Are Just Doing Their Jobs — Too Well



Porter Ranch residents suffering from headaches, nausea and other symptoms from a natural gas leak that has displaced thousands are assigning blame to a damaged well in the Santa Susana Mountains north of Los Angeles.

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But the real culprit is a safety feature in a transmission system that carries gas from hundreds of miles away.

Producers in Texas, the Midwest and Rocky Mountain states inject trace amounts of two foul-smelling chemicals into the gas for a reason that now seems a rich paradox: to

let noses sniff out the presence of the otherwise odorless methane.

Read more:

<http://www.latimes.com/local/california/la-me-adv-gas-leak-health-20151220-story.html>

EPA Survey Shows \$271 Billion Needed For Nation's Wastewater Infrastructure

The EPA released a survey showing that \$271 billion is needed to maintain and improve the nation's wastewater infrastructure, including the pipes that carry wastewater to treatment plants, the technology that treats the water, and methods for managing stormwater runoff.

The survey is a collaboration between EPA, states, the District of Columbia, Puerto Rico, and other U.S. territories. To be included in the survey, projects must include a description and location of a water quality-related public health problem, a site-specific solution, and detailed information on project cost.

"The only way to have clean and reliable water is to have infrastructure that is up to the task," said Joel Beauvais, EPA's Acting Deputy Assistant Administrator for Water.



"Our nation has made tremendous progress in modernizing our treatment plants and pipes in recent decades, but this survey tells us that a great deal of work remains."

Read more:

<http://yosemite.epa.gov/opa/admpress.nsf/d02490a60ecbb12285257f32005cc13a/e418f2bd321cad9f85257f390052f5be!OpenDocument>

Ergonomics

Long Duration Measurements of Whole-Body Vibration Exposures Associated With Surface Coal Mining Equipment Compared To Previous Short-Duration Measurements.



Previous measurements of whole-body vibration associated with earth-moving equipment at surface coal mines have highlighted the significance of the hazard. Considerable variability in measurement amplitudes, even within the same equipment type operated at the same site, has been noted. However, the measurements have previously been undertaken for relatively short durations. Fifty-nine measurements were collected

from a range of earth-moving equipment in operation at a surface coal mine. Measurement durations ranged from 100 minutes to 460 minutes (median = 340 minutes). The results indicate that the measurements previously observed are not an artifact of the relatively short durations and confirm that operators of dozers and off-road haul trucks, in particular, are frequently exposed to vertical whole-body vibration levels which lie within, or above, the Health Guidance Caution Zone defined by ISO2631.1. Further investigations are justified to identify opportunities for reducing operators' exposure to high amplitude vibrations.

Read more: Journal of Occupational and Environmental Hygiene Accepted author version posted online: 15 Jan 2016 (Available with AIHA membership)

Overexertion Tops Causes of Disabling Work Injuries: Report

Overexertion involving outside sources" remains the leading cause of disabling injuries in the United States, according to the annual Liberty Mutual Workplace Safety

Index, which ranks serious, nonfatal workplace injuries. The category includes lifting, pushing, pulling and other actions involving objects, and cost U.S. businesses \$15.08 billion in

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2013, or almost 25 % of total costs, the report states.

Overexertion also was the No. 1 cause listed in last year's report.

Disabling work injuries amounted to \$61.88 billion in workers' compensation costs, and the top 10 causes totaled \$51.06 billion (82.5 %).

Read more:

<http://www.safetyandhealthmagazine.com/articles/13528-overexertion-tops-causes-of-disabling-work-injuries-report>



Safety

U.S. Companies Pay \$62 Billion per Year for Workplace Injuries



Workplace injuries and accidents that cause employees to miss six or more days of work cost U.S. employers nearly \$62 billion in 2013, the most recent year for which

statistically valid injury data is available from the U.S. Bureau of Labor Statistics (BLS) and the National Academy of Social Insurance, according to the 2016 Liberty Mutual Workplace Safety Index. That is more than \$1billion per week spent on the most disabling, nonfatal workplace injuries.

Read more: <http://ehstoday.com/safety/us-companies-pay-62-billion-year-workplace-injuries>

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are normally exempt from federal OSHA injury and illness recordkeeping and posting requirements. Due to changes in OSHA's recordkeeping requirements that went into effect Jan. 1, 2015, certain previously exempt industries are now covered. Lists of both exempt and newly covered industries are available on OSHA's website. Visit

OSHA's Recordkeeping Rule webpage for more information on recordkeeping requirements.

Read more:

<https://www.osha.gov/as/opa/quicktakes/qt011516.html>

3 Quick Safety Breaks Each Day Ups Awareness, Slashes Incidents

Although there were no injuries, excessive equipment damage and rising safety incidents had begun to take away from the bottom line at AECOM's Black Thunder Mine in Wright, Wyoming. Management convened a group to investigate the incidents and when they did, one fact stood out prominently, says John DePoorter, equipment manager. Almost all the incidents were happening at the same time of day, mid-mornings and mid-afternoon to quitting time. So the mine's safety committee came up with a 10-2-4 plan where all the operators would stop during their shifts at 10 a.m., 2 p.m., and 4 p.m. and get on the radio for a quick safety talk. During that time, operators could update each other on problems with mine site or haul roads, things like icy patches on the road or a missing berm or just safety in general. The strategy not only gives workers



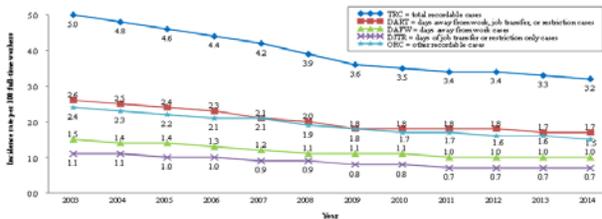
real time safety information, but it fights off fatigue and discourages complacency.

Read more:

<http://www.equipmentworld.com/safety-week-15-lesson-6/#sthash.7tmV6Yy7.dpuf>

The 10 Most-Expensive Non-Fatal Workplace Injuries

Chart 1. Nonfatal occupational injury and illness incidence rates by case type, private industry, 2003-2014



Whether you are a small business owner or director of EHS at a large corporation, you know the importance of safety. It's important not only to workers and their

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families and production schedules; it also is important to the bottom line.

Nothing illustrates that point better than the Liberty Mutual Workplace Safety Index, which ranks the top 10 causes of disabling workplace injuries.

Non-fatal injuries requiring at least six days away from work cost U.S. businesses \$61.88 billion per year in direct workers'

compensation costs according to the 2016 index. The top 10 serious, disabling, non-fatal workplace injuries or accidents account for 82.5 % of that total – \$51.06 billion of the total cost burden.

Read more: http://ehstoday.com/safety/10-most-expensive-non-fatal-workplace-injuries-photo-gallery#slide-0-field_images-44911

Experts Call For OSHA to Regulate Hiring of 'Paris Thin' Models

Health experts are calling for OSHA to regulate the fashion industry to prevent the hiring of models who are "dangerously underweight."

Forbidding "Paris thin" models from working in fashion shows and photo shoots would help prevent serious health issues and even death, authors from the Harvard T.H. Chan School of Public Health wrote in an editorial published Dec. 21 in the American Journal of Public Health.

Read more: [http://www.safetyandhealthmagazine.com](http://www.safetyandhealthmagazine.com/articles/13549-experts-call-for-osh-to-regulate-hiring-of-paris-thin-models)



[/articles/13549-experts-call-for-osh-to-regulate-hiring-of-paris-thin-models](http://www.safetyandhealthmagazine.com/articles/13549-experts-call-for-osh-to-regulate-hiring-of-paris-thin-models)

Emergency Preparedness & Response

AAP Urges Ensuring Kids Are Protected During Public Health Emergencies

Medical countermeasures (MCMs) appropriate for children in case of a pandemic, bioterror attack, or other public health emergency need to be added to the

US Strategic National Stockpile (SNS) and research into pediatric MCMs must be bolstered, according to recommendations

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published yesterday by the American Academy of Pediatrics (AAP).

"The nation's stockpiles and other caches (designated supply of MCMs) where pharmacotherapeutic and other MCMs are stored are less prepared to address the needs of children compared with those of adults in the event of a disaster," the AAP's Disaster Preparedness Advisory Council said in the recommendations. The advisors recommended taking the following steps:

1. Acquire and maintain sufficient quantities of MCMs appropriate for children of all ages in caches such as the SNS.
2. Research and develop pediatric MCMs for any public health emergency.
3. Ensure reasonable steps to protect children as human subjects in MCM research.
4. Address the needs of children and families in planning for MCM implementation, distribution, and administration.

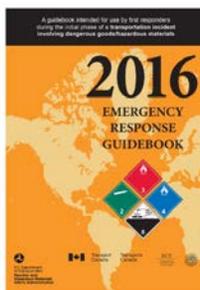


5. Identify anticipated uses of MCMs for children during a public health emergency.
6. Use subject matter experts for advice about pediatric MCMs and MCM distribution planning.
7. Provide pediatric healthcare professionals with access to current information on the appropriate use of MCMs and local distribution plans.

Read more:

<http://www.cidrap.umn.edu/news-perspective/2016/01/news-scan-jan-05-2016>

Breaking Down the Emergency Response Guidebook



The Emergency Response Guidebook (ERG) first was released by the U.S. Department of Transportation in 1973. Since then, the ERG has undergone some changes and has evolved into an efficient and effective means of initial information during an emergency incident.

While some might think that this tool is just for use by emergency responders, they are mistaken. The ERG not only is useful to firefighters, police officers and EMS professionals, but to many others in a variety of industries.

The key to using the ERG is understanding how the guidebook works, and the process used to safely size-up our emergency incidents. This does not necessarily mean that an incident already has occurred.

Read more:

<http://ehstoday.com/emergency->

[management/breaking-down-emergency-response-guidebook](#)

Deployment Health

Repeated Blasts Linked to Brain Changes in Combat Vets

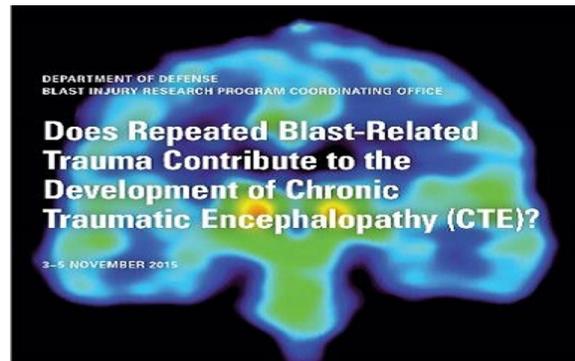
Researchers say they've gained new insight into how repeated exposure to explosions affects the brains of combat veterans.

Many U.S. veterans exposed to blasts have suffered mild traumatic brain injury, but the exact impact on the brain has not been clear.

In a new study, researchers found that the more explosions veterans were exposed to, the greater the odds for chronic changes in activity in the cerebellum.

The team also found that mice exposed to mild blasts lose neurons in the cerebellum. This pattern of loss is similar to that seen in retired boxers, according to the study

published Jan. 13 in the journal Science Translational Medicine.



Read more:

https://www.nlm.nih.gov/medlineplus/news/fullstory_156682.html

Soldiers Test Robotics on 'Battlefield'



Picture a hot summer day in Afghanistan, and a company of 25th Infantry Division Soldiers preparing to move to a new area of operation. Instead of using their legs and backs, these Soldiers are fortunate enough to have a small robot to help them on the battlefield.

It could provide intelligence, surveillance and reconnaissance without putting

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Soldiers in harm's way. Technology like this can be the future of the battlefield and 25th Infantry Division Soldiers are testing this theory.

"This training event has been an exercise to address the basis of issue for Soldier multi-use equipment transport robots in the Pacific region," said Joseph Alexander, Tank Automotive Research, Development and Engineer Center, or TARDEC, representative.

Working with the Tropic Lightning Soldiers first hand is how Army research labs could extend the reach and capability of a platoon or company.

Read more:

http://www.army.mil/article/160539/Soldiers_test_robotics_on_battlefield/

Nanotechnology

Efficiency of Five Chemical Protective Clothing Materials against Nano and Submicron Aerosols When Submitted to Mechanical Deformations



Due to their potential toxicity, the use of nanoparticles in the workplace is a growing concern. Some studies indicate that nanoparticles can penetrate the skin and lead to adverse health effects. Since chemical protective clothing is the last barrier to protect the skin, this study aims to better understand nanoparticle

penetration behaviour in dermal protective clothing under mechanical deformation. For this purpose, five of the most common types of fabrics used in protective clothing, one woven and four nonwoven, were chosen and submitted to different simulated exposure conditions. They were tested against polydispersed NaCl aerosols having an electrical-mobility diameter between 14 and 400 nm. A bench-scale exposure setup and a sampling protocol was developed to measure the level of penetration of the aerosols through the material samples of disposable coveralls and lab coat, while subjecting them to mechanical deformations to simulate the conditions of usage in the workplace. Particle size distribution of the aerosol was determined upstream and downstream using a scanning mobility particle sizer

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(SMPS). The measured efficiencies demonstrated that the performances of nonwoven materials were similar. Three nonwovens had efficiencies above 99%, while the woven fabric was by far, the least effective. Moreover, the results established that mechanical deformations, as simulated

for this study, did not have a significant effect on the fabrics' efficiencies.

Read more: Journal of Occupational and Environmental Hygiene Accepted author version posted online: 19 Jan 2016 (Available with AIHA membership)

Regulatory Research & Industrial Hygiene Professional News

AIHA

Career Stages and Profiles for Success

AIHA and the National Association for Environmental Management (NAEM) will present an overview of their recent work on career trajectories and the skills and competencies required for industrial hygienists and EHS managers at different stages of their career. The webinar will provide valuable and actionable information to help participants manage their careers proactively



Read more:

<https://www.aiha.org/education/CourseCalendar/eLearning/Pages/16JAN2WB-CareerStagesandProfilesforSuccess.aspx>

Congress

Senate Passes TSCA Reform Bill

Acting on a unanimous voice vote Dec. 18, the U.S. Senate passed the Frank R. Lautenberg Chemical Safety for the 21st Century Act, a reform bill to overhaul the Toxic Substances Control Act of 1976.

"With the recent passage of the Frank R. Lautenberg Chemical Safety for the 21st Century Act which the Senate unanimously agreed to pass, Congress has a historic opportunity to enact the first major environmental law rewrite in decades. The overwhelming support of this bill shows the great need to responsibly update this almost 40 year-old law and direct EPA to ensure greater protection for American families as well as our national economy through a transparent and scientifically rigorous process. This bill creates regulatory certainty for businesses not only in the

The Toxic Substance Control Act (TOSCA) of 1976

- To deal with this, the Toxic Substance Control Act (TOSCA) was passed.
- Gave the EPA broad powers to control the distribution and use of commercial and industrial chemicals *known or thought to be hazardous to human health and the environment.*

United States, but across the world," said U.S. Sen. Jim Inhofe, R-Okla., chairman of the Environment and Public Works Committee.

Read more:

<https://ohsonline.com/articles/2015/12/21/senate-passes-tsca-reform-bill.aspx>

White House

President Obama Proposes Unemployment Insurance Reforms



President Obama announced new proposals to provide workers with wage insurance, stronger unemployment insurance protections, and support for retraining to find another job. A summary posted on the White House website said they are "part of

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the Administration's broader push to strengthen and modernize our Unemployment Insurance system by closing holes in coverage and strengthening connections to work."

Read more:

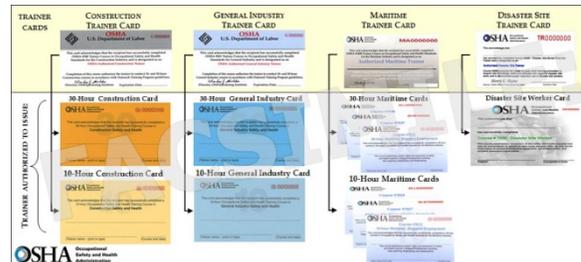
<https://ohsonline.com/articles/2016/01/16/unemployment-changes.aspx?admgarea=news>

OSHA

OSHA to Introduce More Durable and Secure Outreach Trainer And Student Cards

OSHA is introducing more durable and secure completion cards for its Outreach Training Program, including 10-hour and 30-hour voluntary safety classes. The new cards are intended to reduce fraud and improve efficiency.

OSHA has created 10- and 30-hour basic safety courses tailored to construction, maritime, and general industry, as well as 15-hour classes for disaster site workers. They cover the basics of workers' rights and OSHA protections, and describe how to identify, avoid and prevent workplace hazards. The courses are not required by OSHA, although some cities and employers do require workers to complete them. More



than 830,000 students were trained under this program in fiscal year 2015.

Read more:

https://www.osha.gov/pls/oshaweb/owadi.sp.show_document?p_table=NEWS_RELEASES&p_id=29412

NIOSH

New NIOSH Study Supports the OSHA Annual Fit Testing Requirements for Filtering Facepiece Respirators

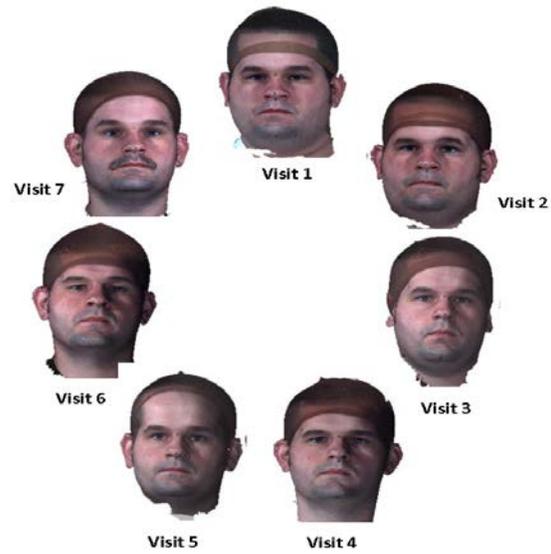
Results of a recently completed NIOSH study confirm the necessity of the current

OSHA respirator fit testing requirement, both annually and when physical changes

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have occurred. The study's conclusions emphasize that respirator users who have lost more than 20 pounds should be re-tested to be sure that the current size and model of respirator in use still properly fits.

For over three years, NIOSH researchers followed a cohort of 229 subjects measuring N95 filtering facepiece respirator (FFR) fit and physical characteristics (e.g., face size, weight) every six months. Prior to this study, very little research existed looking at the relationship between respirator fit over an extensive period of time and the change in facial dimensions, as could be caused by weight gain or loss. OSHA requires FFR users to undergo an annual fit test, which is vital to ensuring continued proper respirator fit.



Read more: <http://blogs.cdc.gov/niosh-science-blog/2016/01/05/fit-testing/>

FMCSA Proposes Rule to Focus on Higher-Risk Motor Carriers



The Federal Motor Carrier Safety Administration has issued a proposed rule designed to improve the ability to identify non-compliant motor carriers. The Safety Fitness Determination (SFD) would update FMCSA's safety fitness rating methodology by integrating on-road safety data with results of investigations and crash reports in

order to determine a motor carrier's safety fitness month-to-month. Being published Jan. 21 in the Federal Register, the rule will create new methods for a motor carrier to be proposed unfit; the rule will be available at www.regulations.gov at docket number FMCSA-2015-0001. Comments are due by March 21.

Read more: <https://ohsonline.com/articles/2016/01/20/fmcsa-proposes-rule-to-determine-safety-fitness-of-motor-carriers.aspx?admgarea=ht.TransportationSafety>

Training

APHC

Something is Wrong, I Can't Get My Blackboard Certificate

AKO EMAIL CHANGES

Want to receive e-mails from ATSC-ELLC at another e-mail address?

Users can now update their ATSC-ELLC Online profile to direct course communications to ANY email, whether .mil, .com or other. By updating their user profile email address, users can direct where course announcements, notifications, and course communication are delivered.

To enable, update the e-mail field located [here](#). Upon doing so, all e-mails sent from ATSC-ELLC Online will be sent to the address in your profile. **This WILL NOT impact messages sent from other systems.**

Non-Army AKO Holders: This change impacts the ATSC-ELLC profile only. To maintain AKO sponsorship, your AKO external email addresses will remain the same, and must remain populated with a .mil (non-AKO) email address.

AKO email addresses will no longer be valid as of March 31, 2015. Please update your Blackboard profile by changing your email address from AKO (@us.army.mil) address to the preferred military Enterprise address (@mail.mil).

If you have any questions or concerns, please contact the Army Training Help Desk at 1-800-275-2872 (option 2) or Email:athd@mailds01.csd.disa.mil, Subject: Blackboard.

Thank you,

ATSC-Blackboard Team

Instructors are happy to issue students a certificate upon successfully completing a course in Blackboard. However, Blackboard can no longer send mail and certificates to your Army Knowledge Online (AKO) email address.

The Blackboard Administrator requested almost a year ago that all users change their email address from the outdated AKO format ([your.name@us.army.mil](#)) and replace it with the new enterprise format ([your.name.civ@mail.mil](#)). When students register for courses in Blackboard, the outdated AKO email automatically becomes the default email. If you don't update your

email address using the new enterprise format ([your.name.civ@mail.mil](#)) BEFORE you begin to take a course and take the exam, you will not receive emails and certificates. In order to get credit for your hard work and receive CEUs, you must change your email address in Blackboard to [your.name.civ@mail.mil](#) or [your.name.ctr@mail.mil](#), for contractors. You and only you have the capability to change your email address in Blackboard.

Once you have changed your email address to the proper format ([your.name.civ@mail.mil](#) or [your.name.ctr@mail.mil](#)), it can take up to 48 hours before it is registered in Blackboard. Wait 2 days, then log back into Blackboard and confirm the changes before proceeding to complete the course work and exam.

Please follow the instructions on the Blackboard website! Remember Blackboard no longer uses AKO email. To ensure that you can receive your Blackboard certificates and emails, change

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your email address to the new enterprise format. For more information about updates and changes, go to <https://amsc.elic.learn.army.mil> and log into Blackboard.

Upcoming Training



February 2016

- February 22-26 APG, MD DOEHRS-IH Initial Army Course
- February 22-26 APG, MD Industrial Ventilation Course



February/March 2016

- February 29-March 4 APG, MD Industrial Hygiene Intermediate Course (Phase 2)



May 2016

- May 16-20 APG, MD DOEHRS-IH Initial Army Course



August 2016

- August 1-5 APG, MD DOEHRS-IH Initial Army Course



October 2016

- October 24-28 APG, MD DOEHRS-IH Initial Army Course



August 2016

- August 1-5 APG, MD DOEHRS-IH Initial Army Course



TBD 2016

- Date/Location TBD Indoor Air Quality Course CP12 Sponsored



February 2017

- TBD APG, MD Blueprint Reading & Design Review Course

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



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On the Web:

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



Training Announcements

Did you know?

- It is never too early to apply for funding for future courses!
- Careerists who have completed mandatory course work (Army DOEHS-IH Initial Course & Intermediate Industrial Hygiene Topics Course for 0690s) will receive first priority for seats and funding when requesting non-mandatory training.
- The 2017 Industrial Hygiene Intermediate Topics Course Phase 1 will open within the next month in Blackboard! For any 0690s that haven't had this mandatory course, now is the time to register.
- The 8-Hour HAZWOPER Refresher Course is now available on Blackboard. Its Blackboard Course ID: 124_HAZWOPER_REFRESHER__0102P59_2015_002_00_
- The next Blueprint Reading and Design Review Course will be held in 2017.

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