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Army Industrial Hygiene News and Regulatory Summary

Hazardous Substances

Performance Evaluation of Disposable Inhalable Aerosol Sampler at a Copper Electrorefinery

This study evaluates the performance of the disposable inhalable aerosol sampler (DIAS), a new sampler developed to be more cost-effective than the traditional inhalable particle samplers and comparable to the inhalable particle sampling convention. Forty-eight pairs of the DIAS prototype and the IOM sampler were utilized to collect copper exposure measurements (23 personal and 25 area) at an electrorefinery facility. The geometric mean (GM) value of ratios of exposure data (DIAS/IOM) was 1.1, while the GM of ratios (DIAS/IOM) was 1.6 for the area exposure data, revealing 84%of the ratios were greater than one. For both personal and area exposure data, the concordance correlation coefficient tests revealed significant disagreements between the two types of samplers and suggested precision as the source of the disagreement. The estimated mean concentration was higher for the DIAS compared that for the IOM for the area exposure data ($p < 0.05$), while the results were comparable for the personal exposure data ($p = 0.49$). Overall, the DIAS generated higher exposure results compared to the IOM sampler for the area exposures. For the personal exposures, the findings were inconclusive due to inconsistent results of factors aforementioned. This study is limited to one metal component (copper) of the dust at a worksite. To date, this is the first field evaluation using personal exposure data to test the performance of the DIAS and the second evaluation using area exposure data. Thus, it will be necessary to conduct additional field evaluations with various elements to further evaluate the performance of the DIAS. In addition, particle migration to the internal walls of the cap was observed during the transportation of collected samples to a laboratory for both sampler types (6.4% for the DIAS and 7.4% for the IOM). Occupational health and safety professionals should be aware of potential errors caused from transferring samples from a field to a laboratory and should be careful not to exclude particles collected on the caps.

Read more: Journal of Occupational and Environmental Hygiene, Accepted author version published online 28 Jan 2019 (Available with AIHA membership)

Special Interest Articles:

- *CBRN*
- *Frost Quake*
- *Microplastics*
- *Housekeepers*
- *Combat Boot*

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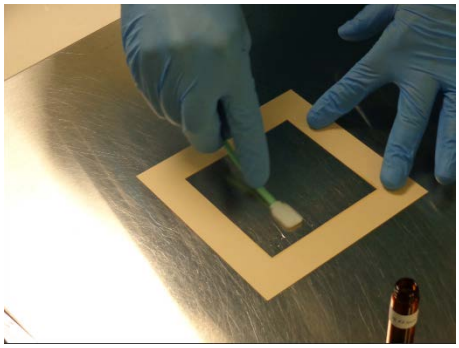
Efficacy of Four Cleaning Solutions for the Decontamination of Selected Cytotoxic Drugs on the Different Surfaces of an Automated Compounding System



The automated aseptic preparation of ready-to-administer antineoplastic drug solutions with robotic systems reduces the risk of occupational exposure. However, the surfaces in the preparation area of the robot are to be cleaned by wiping with an appropriate cleaning solution. The aim of the study was to evaluate the cleaning efficacy of four cleaning solutions on four surface materials installed in the APOTECA chemo robot. Predefined amounts of cisplatin (Cis), 5-fluorouracil (5-FU), and cyclophosphamide (CP) were intentionally spread on test plates made of stainless steel, aluminium, polyoxymethylene, and polycarbonate just as installed in the robotic system APOTECAchemo. After drying, the plates were cleaned with 0.2% ethanolic NaOH, 0.23% isopropanolic sodium dodecylsulfate (SDS-2P), 0.5% sodium hypochlorite (NaOCl), and 0.1% benzalkonium chloride (BZK) solutions following a standardized wiping protocol. Residual contamination was recovered with wipe tests, Pt was quantified by voltammetry, and 5-FU and CP was quantified by gas chromatography-tandem mass spectrometry (GC-MSMS). The mean residual contamination after cleaning and the cleaning efficacy (CE) rates were calculated and aggregated on different levels. The CE rates varied between 81.5% and 100% and lay in the majority of cases above 90%. The lowest CE rates were registered for Pt contamination.

Especially on aluminium surfaces the residual contamination was high. The overall CE rates of the three different drugs and four different surface types amounted to 98.3% for NaOCl, 97.9% for SDS-2P, 96.9% for

ethanolic NaOH, and 96.5% for BZK. The tested cleaning solutions proved to be higher than 90% in most cases, but none of them was able to eliminate 100% of the intentional surface contamination of three antineoplastic drugs on the test plates. The cleaning efficacy varied according to the different surface types and antineoplastic drug. Results could be used in the daily clinical practice to develop and implement effective cleaning procedures.

Read more: Journal of Occupational and Environmental Hygiene, Accepted author version published online 28 Jan 2019 (Available with AIHA membership)

Actual and Simulated Weather Data to Evaluate Wet Bulb Globe Temperature and Heat Index as Alerts for Occupational Heat-Related Illness

Heat stress occupational exposure limits (OELs) were developed in the 1970s to prevent heat-related illnesses (HRIs). The OELs define the maximum safe wet bulb globe temperature (WBGT) for a given physical activity level. This study's objectives were to compute the sensitivity of heat stress OELs and determine if Heat Index could be a surrogate for WBGT. We performed a retrospective analysis of 234 outdoor work-related HRIs reported to the Occupational Safety and Health Administration in 2016. Archived NOAA weather data were used to compute each day's maximum WBGT and Heat Index. We defined the OELs' sensitivity as the percentage of incidents with WBGT > OEL. Sensitivity of the OELs was between 88% and 97%, depending upon our assumption about acclimatization status. In fatal cases, the OELs' sensitivity was somewhat higher (92–100%). We also computed the

sensitivity of each possible Heat Index discrimination threshold. A Heat Index threshold of 80 °F (26.7 °C) was exceeded in 100% of fatalities and 99% of non-fatal HRIs. In a separate analysis, we created simulated weather data to assess associations of WBGT with Heat Index over

a range of realistic outdoor heat conditions. These simulations demonstrated that for a given Heat Index, when radiant heat was included, WBGT was often higher than previously reported. The imperfect correlation between WBGT and Heat Index precluded a direct translation of OELs from WBGT into Heat Index. We conclude that WBGT-based heat stress exposure limits are highly sensitive and should be used for workplace heat hazard assessment. When WBGT is unavailable, a Heat Index alert threshold of approximately 80 °F (26.7 °C) could identify potentially hazardous workplace environmental heat.

Read more: Journal of Occupational and Environmental Hygiene, Accepted author version published online 28 Jan 2019 (Available with AIHA membership)

Development of Quantitative Estimates of Wood Dust Exposure in a Canadian General Population Job-Exposure Matrix Based on Past Expert Assessments

The CANJEM general population job-exposure matrix summarizes expert evaluations of 31 673 jobs from four population-based case–control studies of cancer conducted in Montreal, Canada. Intensity in each CANJEM cell is represented as relative distributions of the ordinal (low, medium, high) ratings of jobs assigned by the experts. We aimed to apply quantitative concentrations to CANJEM cells using Canadian historical measurements from the Canadian Workplace Exposure Database (CWED), taking exposure to wood dust as an example.

Read more:
https://academic.oup.com/annweh/article-abstract/63/1/22/5127317?redirectedFrom=fulltext

Characterization of Occupational Exposures to Respirable Silica and Dust in Demolition, Crushing, and Chipping Activities

Objectives
Exposures to respirable crystalline silica (RCS) and respirable dust (RD) were investigated during demolition, crushing, and chipping at several Massachusetts construction sites.

Methods
Personal breathing zone samples (n = 51) were collected on operating engineers working at demolition and crushing sites, laborers performing miscellaneous tasks at demolition sites, crushing machine tenders at crushing sites, and chipping workers at substructure bridge repair sites. Area samples (n = 33) were collected at the perimeter of demolition and crushing sites to assess potential bystanders' exposures.

Read more: https://academic.oup.com/annweh/article/63/1/34/5151112)

Derivation of Internal Dose-Based Thresholds of Toxicological Concern for Occupational Inhalation Exposure to Systemically-Acting Organic Chemical Vapors

This study aimed at deriving occupational thresholds of toxicological concern for inhalation exposure to systemically-acting organic chemical vapors using predicted internal doses. The latter were also used to evaluate the quantitative relationship between occupational exposure limit and internal dose. Three internal dose measures were identified for investigation: (i) the daily area under the venous blood concentration versus time curve, (ii) the daily rate of the amount of parent chemical

metabolized and (iii) the maximum venous blood concentration at the end of an 8-h work shift. A dataset of 276 organic chemicals with 8-hr threshold limit values-time-weighted average was compiled along with their molecular structure and Cramer classes (Class I: low toxicity, Class II: intermediate toxicity, Class III: suggested significant toxicity). Using a human physiologically-based pharmacokinetic model, the three identified dose metrics were predicted for an 8-hr occupational inhalation exposure to the threshold limit value for each chemical. Distributional analyses of the predicted dose metrics were performed to identify the percentile values corresponding to the occupational thresholds of toxicological concern. Also, simple linear regression analyses were performed to evaluate the relationship between the 8-h threshold limit value and each of the predicted dose metrics, respectively. No threshold of toxicological concern could be derived for class II due to few chemicals. Based on the daily rate of the amount of parent chemical metabolized, the proposed internal dose-based occupational thresholds of toxicological concern were 5.61 × 10−2 and 9 × 10−4 mmol/d at the 10th percentile level for classes I and III, respectively, while they were 4.55×10−1 and 8.5 × 10−3 mmol/d at the 25th percentile level. Even though high and significant correlations were observed between the 8-hr threshold limit values and the predicted dose metrics, the one with the rate of the amount of chemical metabolized was remarkable regardless the class (r2 = 0.81; n = 276). The proposed internal dose-based occupational thresholds of toxicological concern are potentially useful for screening-level assessments as well as prioritization within an integrated occupational risk assessment framework.

Read more: Journal of Occupational and Environmental Hygiene, Accepted author version published online 24 Jan 2019 (Available with AIHA membership)

Modelling Of Exposure to Respirable and Inhalable Welding Fumes at German Workplaces

The International Agency for Research on Cancer classified welding fumes as carcinogenic to humans, and occupational exposure limits should be established to protect welders. The aim of this study is to estimate exposure levels to inhalable and respirable welding fumes by welding process in order to use them for exposure assessment in epidemiological studies and to derive occupational exposure limits. In total, 15,473 mass concentrations of

inhalable and 9,161 concentrations of respirable welding fumes could be analyzed along with welding-related and sampling information, which were compiled in the German database MEGA between 1983 and 2016. In both particle-size fractions, model-based geometric means of the concentrations were estimated by welding process and material for frequently used welding processes adjusted for sampling time and median-centered for calendar years.

The inhalable concentrations were approximately twice the respirable concentrations, with medians of 3 mg/m3 (inter-quartile range: 1.2-7.0 mg/m3) and 1.5 mg/m3 (inter-quartile range: < limit of detection -3.8 mg/m3), respectively. The adjusted geometric means of flux-cored arc welding, metal inert and active gas welding, shielded metal arc welding and torch cutting ranged from 0.9 to 2.2 mg/m3 for respirable welding fumes and from 2.3 to 4.7 mg/m3 for inhalable fumes. In both particle-size fractions, geometric means were between 0.1 and 0.9 mg/m3 when performing tungsten inert gas, autogeneous, resistance, laser and plasma welding or spraying. Results derived from this large dataset are useful for a quantitative exposure assessment to estimate health risks of welders.

Read more: Journal of Occupational and Environmental Hygiene, Accepted author version published online 28 Jan 2019 (Available with AIHA membership)

Radiation

The Impact of Canister Geometry on Chemical Biological Radiological and Nuclear Filter Performance: A Computational Fluid Dynamics Analysis

Steady-state axisymmetric simulations using the Reynolds-Averaged Navier-Stokes equations have been carried out in order to optimize the performance of a Chemical, Biological, Radiological, and Nuclear (CBRN) canister filter for its use in a powered air-purifying respirator (PAPR). Alterations have been made to the shape of the canister, the spacing of the rear wall of the canister with regard to the carbon filter, and the bracketing between (i) the particulate filter and the carbon bed and (ii) the carbon bed and the canister wall. The pressure drops across the canister and the residence time distribution at the rear of the carbon bed have been analyzed in detail based on an

extensive parametric analysis involving the aforementioned variations. It has been demonstrated that the non-uniform porosity profile of the carbon bed resulted in alternating regions of high and low velocity close to the canister wall, providing a possible route for breakthrough. Designs, which included a bracket at the rear of the carbon bed, blocked this route and consequently had a longer minimum mean residence time than those, which did not. It has also been shown that the spacing between the carbon bed and the canister rear wall had a large impact on both residence time and pressure drop. In cases where the carbon backed directly onto the canister rear wall flow in the axial direction from the outside wall toward the canister axis resulted in far greater pressure drop and a reduction in minimum mean residence time within the carbon bed.

Read more: *Journal of Occupational and Environmental Hygiene, Accepted author version published online 28 Jan 2019 (Available with AIHA membership)*

Testing a Revised Inlet for the Personal Dust Monitor

A person-wearable dust monitor that provides nearly real-time, mass-based readings of respirable dust was developed for use in underground coal mines. This personal dust monitor (PDM) combined dust sampling instrumentation with a cap lamp (and battery) into one belt-wearable unit, with the air inlet mounted on the cap lamp. However, obsolescence of belt-carried cap lamp and batteries in coal mining ensued and led end users to request that the cap lamp and battery be removed from the PDM. Removal of these components necessitated the design of a new air inlet to be worn on the miner's lapel. The revised inlet was tested for dust collection equivalency against the original cap-mounted inlet design. Using calculated inlet respirable fractions and measured dust mass collection, the performance of the two inlets is shown to be similar. The new inlet requires a 1.02 factor for converting

dust masses obtained from it to equivalent masses collected from the original inlet.

Read more: Journal of Occupational and Environmental Hygiene, Accepted author version published online 28 Jan 2019 (Available with AIHA membership)

Ventilation

Research Suggests That Smart Buildings Are Vulnerable To Hackers

According to research by cyber security firm ForeScout, Internet of Things (IoT) devices within smart buildings are regularly unsecured from hackers.

ForeScout reportedly discovered thousands of vulnerable devices using search engines Shodan and Cenys, many of which were located in hospitals and schools.

Heating, ventilation, and air conditioning (HVAC) systems were among those that the team believes it could have taken control over after it developed its own proof-of-concept malware.

Physical access control systems, which prohibit non-authorised personnel from accessing restricted areas in hospitals and airports, were also found to be vulnerable.

Read more: https://www.systemtek.co.uk/2019/01/research-suggests-that-smart-buildings-are-vulnerable-to-hackers/

PPE

Protective Glove and Gown Use when Administering Antineoplastic Drugs

Female nurses who administer antineoplastic drugs – medications used to treat cancer – don't always wear protective clothing, according to a new NIOSH study published online in the American Journal of Nursing, accompanied by a video abstract. This is one of the first studies to explore the use of antineoplastic drugs and personal protective equipment among non-pregnant and pregnant female nurses.

Read more:
https://www.cdc.gov/niosh/updates/upd-01-09-19.html

Hospitals Lax On Respiratory Protection

Evidence from National Institute for Occupational Safety and Health (NIOSH) surveillance studies indicates gaps in hospitals' respiratory protection programmatic operations and healthcare workers' (HCWs) marginal compliance with respiratory protection recommended practices. Improper use of respiratory protective devices (RPDs) may expose HCWs to infectious respiratory illnesses.

Read more:
https://www.ishn.com/articles/110119-hospitals-lax-on-respiratory-protection

Noise

The Polar Vortex Is Causing Startling 'Frost Quakes.' Here's the Science behind Them

Weather that feels like it's -50° F outside is unnerving enough on its own. But for some midwesterners trapped in an icy polar vortex this week, those bone-chillingly cold temperatures have been accompanied by an unsettling phenomenon: loud and seemingly inexplicable banging sounds.

Read more: https://news.yahoo.com/polar-vortex-causing-startling-apos-183211918.html

Preventive Medicine

Ten Threats to Global Health In 2019

The world is facing multiple health challenges. These range from outbreaks of vaccine-preventable diseases like measles and diphtheria, increasing reports of drug-resistant pathogens, growing rates of obesity and physical inactivity to the health impacts of environmental pollution and climate change and multiple humanitarian crises.

To address these and other threats, 2019 sees the start of the World Health Organization's new 5-year strategic plan – the 13th General Programme of Work. This plan focuses on a triple billion target: ensuring 1 billion more people benefit from access to universal health coverage, 1 billion more people are protected from health emergencies and 1 billion more people enjoy better health and well-being. Reaching this goal will require addressing the threats to health from a variety of angles.

Read more:
https://www.who.int/emergencies/ten-threats-to-global-health-in-2019

Diet, Physical Activity, and Daylight Exposure Patterns in Night-Shift Workers and Day Workers

Night-shift work has been reported to have an impact on nutrition, daylight exposure, and physical activity, which might play a role in observed health effects. Because these exposures show diurnal variation, and shift work has been related with disturbances in the circadian rhythm, the timing of assessment of these factors requires careful consideration. Our aim was to describe the changes in patterns of diet,

physical activity, and daylight exposure associated with night-shift work.

Read more:
https://academic.oup.com/annweh/article/63/1/9/5248266

Unique IoT Wearable Device Could Offer Safety Benefits to Construction Workers

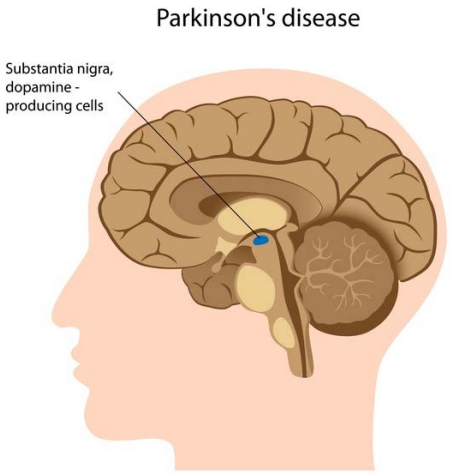
Three companies are investigating the potential safety benefits of new a wearable device at construction sites.

Travelers Companies, Inc. announced a partnership with Gilbane and Triax Technologies to study the potential safety benefits a special IoT wearable device can provide construction site workers. Travelers Companies is an insurance firm, Gilbane is one of the country's largest contractors, and Triax Technologies is a leader in Internet of Things (IoT) construction technology

Read more:
http://www.qrcodepress.com/unique-iot-wearable-device-could-offer-safety-benefits-to-construction-workers/8535444/

The Search for Environmental Causes of Parkinson's Disease Moves Forward

Environmental factors are widely believed to play a key role in the development of Parkinson's disease (PD), but little is known about specific environmental triggers. Writing in the Journal of Parkinson's Disease, scientists review novel research hypotheses and approaches that may help better define the role of environment in the development of PD, especially before a diagnosis can be made based on the characteristic motor dysfunction for which PD is known.



Read more:
https://www.sciencedaily.com/releases/2019/01/190131125957.htm

Protecting Those on the Frontline from Ebola

Online training has increased the knowledge of health care workers about effective prevention of Ebola up to 19 percent and reduced critical errors to 2.3 percent in a small cohort. These findings suggest that the program could improve protection of health care workers from Ebola and, because it will be easily accessible via the Internet, could be especially useful in low-resource settings.

Read more:
https://www.sciencedaily.com/releases/2019/02/190202171849.htm

Environmental Health

Microplastics in River Raise Health, Environmental Concerns

A cubic meter of Tennessee River water contains about 17,000 tiny plastic particles, and scientists' increasing concern about the health effects of those microplastics when ingested by humans has added urgency to recent cleanup efforts.

Tennessee Riverkeeper last week organized a cleanup effort at Dry Branch Creek, a heavily littered waterway that connects to the Tennessee River in Decatur, and a dozen volunteers collected almost a ton of plastic and other materials.

Read more:
https://www.decaturdaily.com/news/local/microplastics-in-river-raise-health-environmental-concerns/article_446281da-a4db-59b9-ab8a-a3066c0bd6b1.html

Endotoxin, Cat, and House Dust Mite Allergens in Electrostatic Cloths and Bedroom Dust

Environmental exposure to endotoxin, Fel d I (cat) allergen and Der p I (house dust mite) allergen have been associated with asthma symptoms and have been measured in the environment using various sampling methods, including the electrostatic dust collector. The objectives of this study were to investigate whether levels of endotoxin and allergens were detectable in electrostatic dust collectors and to examine the correlation of allergen and endotoxin levels between electrostatic dust collectors and vacuum sampling methods (floor dust and mattress dust). Electrostatic cloths, bedroom floor dust and mattress dust samples from a subset of 60 homes were randomly selected from the Health of Occupants of Mouldy Homes study for allergen and endotoxin analysis. Fel d I and Der p I allergens were analyzed by double monoclonal antibody ELISA and endotoxin by the kinetic Limulus amoebocyte lysate assay. An enhanced ELISA method was used to analyze Der p I in the electrostatic cloths. Endotoxin was detected in all samples, however Fel d I and Der p I were not detected in all electrostatic dust collector samples (detection in 53% and 15% of cloths respectively). No correlations were found between cloth and dust samples for endotoxin or Der p I, but moderate-to-strong correlations were found between all three sampling methods for Fel d I (r_s = 0.612–0.715, $p < 0.001$). Poor correlation was found between floor dust and mattress dust samples for Der p I (r_a = 0.256, p = 0.048). Electrostatic dust collectors may provide a way to measure airborne dust and allergen. Given the moderate-to-low correlations with vacuum dust sampling, this may present a unique measurement system which, when collected alongside traditional vacuum dust sampling, could provide additional exposure measures. Further studies are required to correlate endotoxin and allergen levels measured by electrostatic dust collector with air sampling and to explore the relationships between these bioaerosols, environmental factors and asthma.

Read more: *Journal of Occupational and Environmental Hygiene published online 28 January 2019 (Available with AIHA membership)*

Report: Wind Turbines Have No Negative Effect on Health

The sound of rotating wind turbine blades does not have a negative effect on a person's health, a new report by the Iowa Policy Project states. While turbines can be linked to a level of annoyance by nearby property owners, there is no connection between whirring blades and headaches, stress or a lack of sleep, according to the report.

Read more:
https://wcfcourier.com/news/local/govt-

and-politics/report-wind-turbines-have-no-negative-effect-on-health/article_975c1b42-6751-561b-a6f1-8c0207185d21.html

New EPA Rule May Hinder Health Research

The rule mandates that all underlying data from studies be made available to any and all researchers in the interests of transparency. But while transparency is generally a laudable goal, the rule may be used to throw out older studies for which data is no longer available and newer studies with data that can't be shared because of patient privacy issues, said Dr. Renee Salas, the lead author on an opinion piece published in the Annals of Internal Medicine.

Read more:
https://www.reuters.com/article/us-health-science-environment-idUSKCN1PM2M1

Ergonomics

Stressors, Allostatic Load, and Health Outcomes among Women Hotel Housekeepers: A Pilot Study

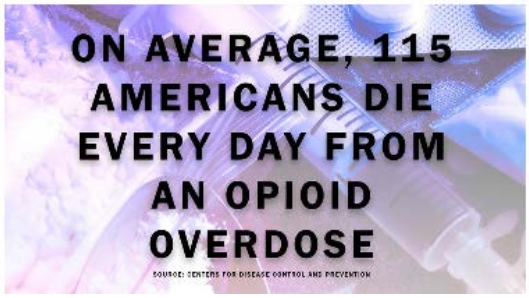
Hotel housekeepers are exposed to stressors at work and outside of work. Little is known about these workers' pathophysiological responses to those stressors. Allostatic load is a concept increasingly used to understand pathophysiologic manifestations of individuals' bodily response to stress. The purpose of this study was to examine the associations between work and non-work stressors, allostatic load, and health outcomes among hotel housekeepers. Work and non-work stressors (e.g., the number of traumatic events, everyday discrimination, and job strain) and health outcomes (e.g., general health status, physical and mental health, and chronic diseases) were measured. Biometric and anthropometric measures and fasting blood specimens were collected. Blood biomarkers included CRP, HbA1c, HDL, and cortisol. Descriptive analyses, correlations, regressions, and t-tests were conducted. Forty-nine women hotel housekeepers participated, with a mean age of 40 years. One-fifth reported high job strain and over 40% had at least one traumatic event. Chronic conditions were commonly reported, with about 78%, 55%, and 35% reporting one, two, and three chronic conditions, respectively. Correlation analyses showed that reports of high job strain and everyday discrimination were significantly associated with high ALI quartile score ($r = 0.39$, $p = 0.011$; $r = 0.41$, $p = 0.004$). Job strain and everyday discrimination had medium to large effect sizes on ALI quartile scores. High ALI quartile score was significantly associated with having at least one chronic disease ($r = 0.40$, $p = 0.005$), and it had a large effect size on chronic diseases. To our knowledge, this is the first study to explore allostatic load among hotel housekeepers. Hotel housekeepers have high exposure to stressors within and outside of their work and experience poor chronic conditions. Allostatic load had strong associations with both stressors and health outcomes. Despite this worker group being a hard-to-reach worker group to participate in research studies, this study demonstrates the feasibility of accessing, recruiting and collecting survey data and blood samples among them to determine health risks and guide future targeted interventions.

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

version published online 7 Jan 2019
(Available with AIHA membership)

Safety

Report: Americans Are Now More Likely to Die of an Opioid Overdose than on the Road



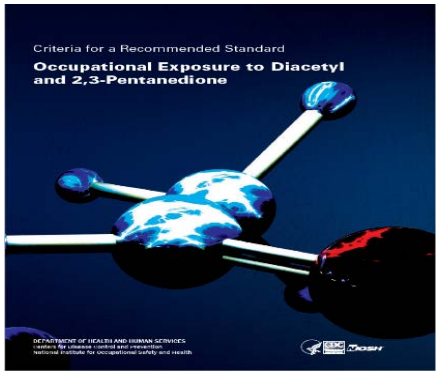
For the first time in U.S. history, a leading cause of deaths — vehicle crashes — has been surpassed in likelihood by opioid overdoses, according to a new report on preventable deaths from the National Safety Council.

Americans now have a 1 in 96 chance of dying from an opioid overdose, according to the council's analysis of 2017 data on accidental death. The probability of dying in a motor vehicle crash is 1 in 103.

Read more:
https://www.npr.org/2019/01/14/684695273/report-americans-are-now-more-likely-to-die-of-an-opioid-overdose-than-on-the-ro

Potential Hazards Not Communicated in Safety Data Sheets of Flavoring Formulations, Including Diacetyl and 2,3-Pentanedione

Workers using flavoring formulations containing diacetyl and 2, 3-pentanedione may be at risk of inhalational exposure, as these volatile hazardous chemicals are emitted from the bulk material, especially at elevated temperatures. However, flavoring formulations that contain diacetyl and 2,3-pentanedione might not list these ingredients because they are generally recognized as safe to ingest, may be part of



a proprietary mixture deemed a trade secret, or may not be required to be listed if they are present at <1% composition. The objective of this study was to investigate whether potential inhalational hazards present in flavoring samples were reported as chemical ingredients on their corresponding safety data sheets (SDSs).

Read more:
https://academic.oup.com/annweh/article/63/1/124/5166998

Winter Work Safety

Limiting exposure to cold temperatures is paramount to preventing illness and injury when working in winter weather. Beyond investing in gear to keep workers warm and dry, safety managers should be rethinking how long – and at what time of day – crews are in the elements.

A cold environment forces the body to work harder to maintain its temperature. Cold ambient air temperature, water and snow all draw heat from the body. High wind speeds and dampness work to accelerate heat loss. For example, when the air temperature is 40° F and the wind speed is 35 mph, exposed skin experiences conditions equivalent to the air temperature being 28° F; the faster the wind speeds, the greater the impact of cold temperatures on the body.

Read more:
https://www.safetyandhealthmagazine.com/articles/17954-winter-work-safety

High Pesticide Exposure among Farmers Linked to Poor Sense of Smell Later

A Michigan State University study is the first to show an association between unusually high pesticide exposure and poor sense of smell among aging farmers.

The research examined more than 11,200 farmers over a 20-year period. At the start of the study, about 16 percent of participants reported having experienced a high pesticide exposure event, or HPEE, such as a large amount of pesticide spilling on their body. Two decades later, they were asked if they suffered olfactory impairment, a partial to complete loss of sense of smell.

Read more:
https://www.sciencedaily.com/releases/2019/01/190116090639.htm

Compressed Air Can Be Lethal

OSHA standard 1910.242(b) relating to hand and portable powered tools and other hand-held equipment is clear on using compressed air for cleaning. “Compressed air shall not be used for cleaning purposes except where reduced to less than 30 psi and then only with effective chip guarding and personal protective equipment.” Nowhere does the standard state that any part of the body can be cleaned with compressed air, which is quite dangerous.

Read more:
https://www.ishn.com/articles/110021-compressed-air-can-be-lethal?v=preview

Emergency Preparedness

Public Spaces Should Stock Bleeding-Control Kits For Mass Casualties, Experts Say

As mass-casualty events and violent attacks in the U.S. continue to increase, military and emergency medicine experts are recommending that public venues install bleeding-control kits for at least 20 victims.

These kits, equipped with nitrile gloves, a basic tourniquet, wound dressing to stop severe bleeding, rolled gauze and trauma scissors, could allow bystanders to help save lives after bombings, mass shootings and stabbings, the study authors write in the American Journal of Public Health.

Read more:
https://www.reuters.com/article/us-health-masscasualties-bleeding-kits/public-spaces-should-stock-bleeding-control-kits-for-mass-casualties-experts-say-idUSKCN1P51ZQ

Deployment Health

Military Hopes 3D Printing Bones Can Help Combat Veterans' Injuries

A lab in Arizona is hoping to help wounded veterans – through 3D printing. Arizona's Orthopedic Research Lab is hoping to use the technology to help military veterans with bone injuries.

Dr. John Szivek, who runs the University of Arizona Orthopaedic Research Lab, said the lab received a $2 million grant from the Department of Defense to create 3D bone printing to help military personnel.

Read more:
https://www.foxnews.com/tech/military-hopes-3d-printing-bones-can-help-combat-veterans-injuries

Soldier Center Tests New Army Combat Boot Prototypes

The U.S. Army Research, Development and Engineering Command Soldier Center at Natick is testing new Army Combat Boot (ACB) prototypes at three different basic training and active duty installations over the next four months. The effort will gather Soldier feedback toward development of improved footwear.

The Army's current inventory of boots includes seven different styles designed for different environments and climates.

Read more:
https://www.army.mil/article/215893/soldier_center_tests_new_army_combat_boot_prototypes

Nanotechnology

Workplace Exposure to Nanoparticles during Thermal Spraying of Ceramic Coatings

Thermal spraying is widely used for industrial-scale application of ceramic coatings onto metallic surfaces. The particular process has implications for occupational health, as the high energy process generates high emissions of metal-bearing nanoparticles. Emissions and their impact on exposure were characterized during thermal spraying in a work environment, by monitoring size-resolved number and mass concentrations, lung-deposited surface area, particle morphology, and chemical composition.

Along with exposure quantification, the modal analysis of the emissions assisted in distinguishing particles from different sources, while an inhalation model provided evidence regarding the potential deposition of particulate matter on human respiratory system. High particle number (>106 cm−3; 30–40 nm) and mass (60–600 μgPM1 m−3) concentrations were recorded inside the spraying booths, which impacted exposure in the worker area (104–105 cm−3, 40–65 nm; 44–87 μgPM1 m−3).

Read more:
https://academic.oup.com/annweh/article/63/1/91/5247672

Regulatory Research & Industrial Hygiene Professional News

OSHA

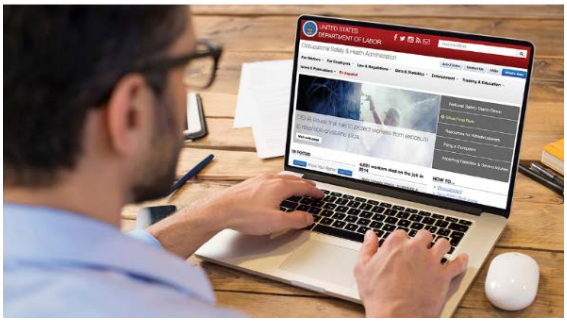
OSHA and MSHA to Hike Civil Penalties

U.S. Department of Labor plans to initiate significant hikes in the civil penalties imposed by OSHA and MSHA. For OSHA, the maximum increases to $132,598 (from $129,336) for willful and repeat violations, while the mandatory minimum penalty is now $9,472. Regular "serious" and “other than serious” citations, as well as failure to abate situations, will carry a new maximum fine of $13,260 (up from $12,934).

Read more: https://www.assp.org/news-and-articles/2019/01/16/osha-and-msha-to-hike-civil-penalties

OSHA Drops Requirement to Electronically Submit OSHA Forms 300 and 301

In what it calls a move to protect worker privacy, OSHA has issued a final rule that eliminates the requirement for establishments with 250 or more employees to electronically submit information from OSHA Form 300 (used to record work-related injuries and illnesses) and OSHA Form 301 (injury and illness incident report) to OSHA each year.



These establishments must continue to maintain those records on-site, and OSHA

will obtain them as needed through inspections and enforcement actions. In addition to reporting required after severe injuries, establishments will continue to submit information from their Form 300A.

Read more: https://www.assp.org/news-and-articles/2019/01/31/osha-drops-requirement-to-electronically-submit-osha-forms-300-and-301

NIOSH

From NIOSH: Chemical Exposure in Healthcare Differs by Task and Product

Cleaning and disinfecting products are complex mixtures of chemicals that can irritate the skin. Evidence also shows that exposure to these products may increase the risk of work-related asthma among healthcare workers. But the effects of specific chemicals remain unclear. Now, a NIOSH study published in the journal Annals of Work Exposures and Health has added to our understanding by linking products and tasks to specific exposures.

Read more:
https://www.ishn.com/articles/110103-from-niosh-chemical-exposure-in-healthcare-differs-by-task-and-product

EPA

Senators Call On EPA to Restrict Key Drinking Water Contaminants

A bipartisan group of 20 senators has called on the Environmental Protection Agency (EPA) to regulate allowable drinking water levels of two chemicals linked to various health problems.

The letter was sent Friday by Sens. Jeanne Shaheen (D-N.H.), Shelley Moore Capito

(R-W.Va.) and others, days after Politico reported that the EPA is expected to decide against setting drinking water limits for perfluorooctane sulfonic acid (PFOS) and perfluorooctanoic acid (PFOA) as part of an upcoming national strategy for dealing with the class of chemicals known as per- and polyfluoroalkyl substances (PFAS).

Read more: https://thehill.com/policy/energy-environment/428102-senators-call-on-epa-to-restrict-key-drinking-water-contaminants

CDC

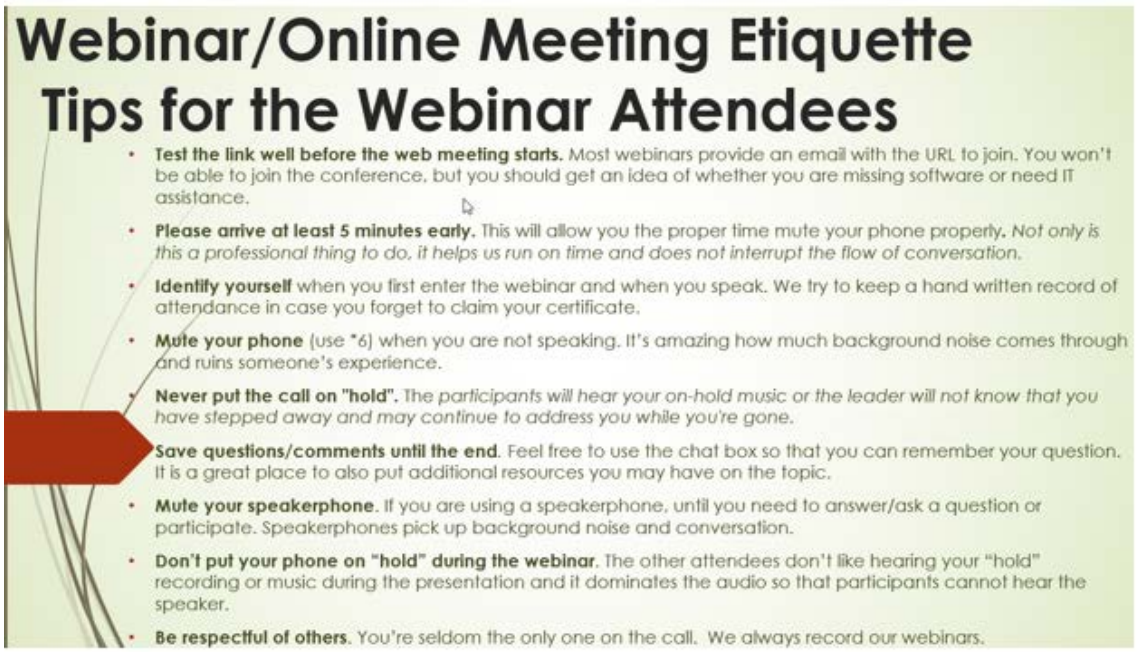
CDC Releases New Field Epidemiology Manual

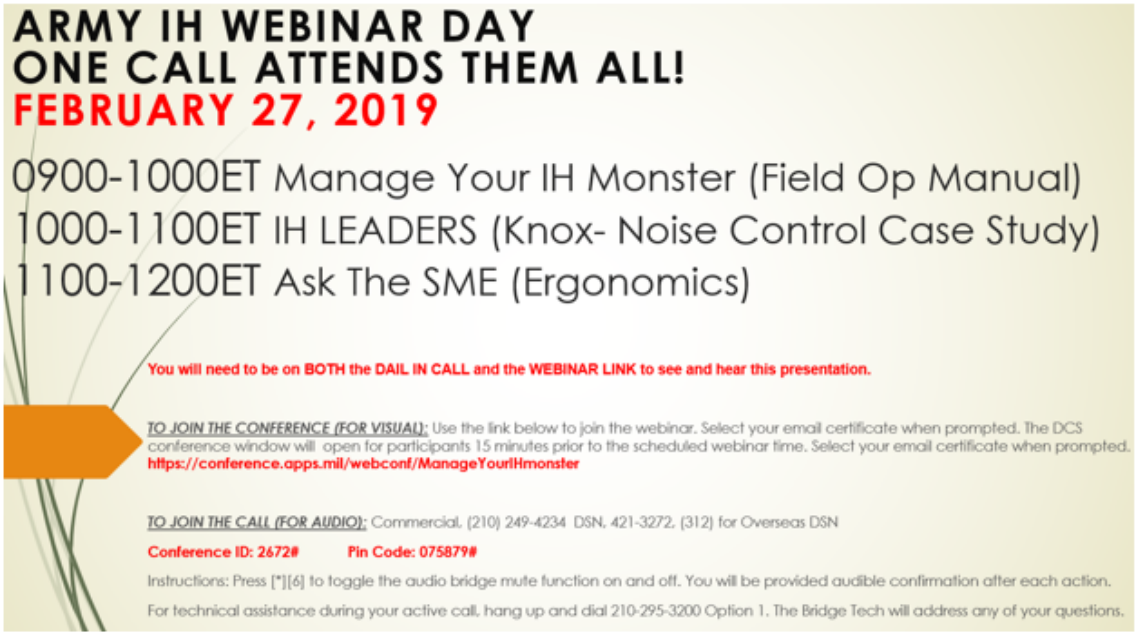
The U.S. Centers for Disease Control and Prevention (CDC) through a partnership with the CDC Foundation and Oxford University Press published "The CDC Field Epidemiology Manual". The manual serves as a definitive guide to investigating acute public health events on the ground and in real-time. Assembled and written by experts from CDC as well as other leading public health agencies, The CDC Field Epidemiology Manual offers current and field-tested guidance for every stage of an outbreak investigation — from identification to intervention and other core considerations along the way.

Read more: https://www.aspph.org/cdc-releases-new-field-epidemiology-manual/?c=1

APHC

Training


Webinar/Online Meeting Etiquette
Tips for the Webinar Attendees
Test the link well before the web meeting starts. Most webinars provide an email with the URL to join. You won't be able to join the conference, but you should get an idea of whether you are missing software or need IT assistance.
Please arrive at least 5 minutes early. This will allow you the proper time mute your phone properly. Not only is this a professional thing to do, it helps us run on time and does not interrupt the flow of conversation.
Identify yourself when you first enter the webinar and when you speak. We try to keep a hand written record of attendance in case you forget to claim your certificate.
Mute your phone (use *6) when you are not speaking. It's amazing how much background noise comes through and ruins someone's experience.
Never put the call on "hold". The participants will hear your on-hold music or the leader will not know that you have stepped away and may continue to address you while you're gone.
Save questions/comments until the end. Feel free to use the chat box so that you can remember your question. It is a great place to also put additional resources you may have on the topic.
Mute your speakerphone. If you are using a speakerphone, until you need to answer/ask a question or participate. Speakerphones pick up background noise and conversation.
Don't put your phone on "hold" during the webinar. The other attendees don't like hearing your "hold" recording or music during the presentation and it dominates the audio so that participants cannot hear the speaker.
Be respectful of others. You're seldom the only one on the call. We always record our webinars.


ARMY IH WEBINAR DAY
ONE CALL ATTENDS THEM ALL!
FEBRUARY 27, 2019
0900-1000ET Manage Your IH Monster (Field Op Manual)
1000-1100ET IH LEADERS (Knox- Noise Control Case Study)
1100-1200ET Ask The SME (Ergonomics)
You will need to be on BOTH the DAIL IN CALL and the WEBINAR LINK to see and hear this presentation.
TO JOIN THE CONFERENCE (FOR VISUAL): Use the link below to join the webinar. Select your email certificate when prompted. The DCS conference window will open for participants 15 minutes prior to the scheduled webinar time. Select your email certificate when prompted.
https://conference.apps.mil/webconf/ManageYourIHmonster
TO JOIN THE CALL (FOR AUDIO): Commercial, (210) 249-4234 DSN, 421-3272, (312) for Overseas DSN
Conference ID: 2672# Pin Code: 075879#
Instructions: Press [*][6] to toggle the audio bridge mute function on and off. You will be provided audible confirmation after each action.
For technical assistance during your active call, hang up and dial 210-295-3200 Option 1. The Bridge Tech will address any of your questions.

Ventilation: Review for DOEHRS Users (1.0hrs)

NOW AVAILABLE ONILINE at https://aiph-dohs.ellc.learn.army.mil

This course is designed as a refresher for Army IH staff that have previously completed the *"Army IH DOEHRS-IH Initial Course"*. This course does not replace the requirement to complete the *"Army IH DOEHRS-IH Initial Course" prior to using the DoD system of record.*

The course is self enrollment and self paced. The lecture has embedded multiple attempt knowledge checks. Passing criteria is 70%.

The purpose of this lesson is to describe and demonstrate Army Business Practice for Ventilation Systems , Components, and Ventilation Surveys in DOEHRS-IH. Instructors will:
Describe how to add, name, and search for Ventilation Systems and Components; add, name, and schedule a Ventilation Survey; and complete a Ventilation Survey.

After viewing this lesson, participants will be able to: Demonstrate how to enter and name ventilation systems, components, and surveys.

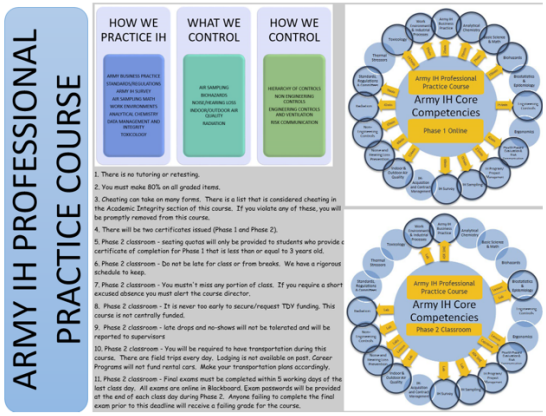
Pesticide Toxicology (1.5hrs)

NOW AVAILABLE ONILINE at https://aiph-dohs.ellc.learn.army.mil

This course is self enrollment and self paced. The lecture has embedded multiple attempt knowledge checks. Passing criteria is 70%.

The purpose of this course is to provide knowledge of occupational illnesses including signs and symptoms; knowledge of the principles of toxicology including symptomatology, pharmacokinetics, mode of action, additive, synergistic, and antagonistic effects, routes of entry, absorption, metabolism, excretion, target organs, toxicity testing protocols, aerosol deposition, clearance in the respiratory tract, carcinogenic, mutagenic, tear at o genic, and reproductive hazards to assign risk to potential exposures. Participants will be able to:

1.Describe details of pests, history of pests, and associated diseases
2.Define pesticide toxicology related terms
3.Provide specific examples of pesticides (organophosphate, carbamate, pyrethroid, organochlorine), herbicides, fungicides and rodenticides
4.Describe the mode of action for various pesticides



Army IH Professional Practice Course

- **DESCRIPTION**: The Army IH Professional Practice Course is a mandatory Department of the Army course for all GS0690 Industrial Hygiene personnel. This course contains mandatory training regarding Army IH Business Practice and Army IH Competencies.
- **REQUIREMENTS:** This course consists of multiple topics and content items. This is a mandatory Department of the Army course for all GS0690 industrial hygiene personnel. Learners will have 365 days after registration to complete the online Phase 1 portion of the course before being considered Overdue. Learners will have 3 years after completion of the online Phase 1 portion of the course to complete the face to face Phase 2 portion of the course. Once both Phase 1 and Phase 2 are complete, the learners will have satisfied the requirement for this mandatory course. In the case of expired Phase 1 certifications, learners will need to register for and complete the next available Phase 1 certification training in the Army Public Health Center Blackboard System (https://aiph-dohs.ellc.learn.army.mil) in order to obtain it and be in compliance with the proponent's policy for this course.
- **TO TAKE THIS COURSE:** Learners must self-enroll in the most current iteration found at https://aiph-dohs.ellc.learn.army.mil using the instructions found on the homepage for self-enrollment.

Industrial Work Environments: Firefighting (1.5hrs)

NOW AVAILABLE ONILINE at https://aiph-dohs.ellc.learn.army.mil

This course is self enrollment and self paced. The lecture has embedded multiple attempt knowledge checks. Passing score is 70%.

The purpose of this course is to provide a basic awareness of the different welding processes Occupational Health and Safety Professionals might encounter when inspecting/surveying worksites. Lessons provide explanations of basic protective fire services terms, descriptions of firefighting processes, a summary of hazards, illustrations of control measures, lists of applicable OSHA and other standards, and descriptions of sampling methods.

After completing this training, the student will be able to:

1. Demonstrate knowledge of stressors by recognizing common types of firefighting processes and equipment.
2. Demonstrate knowledge of stressors by recognizing hazards associated with firefighting processes.
3. Demonstrate knowledge of how to use the DoD 8-Step Exposure Assessment Model Basic Characterization Step by recognizing commonly found controls.
4. Demonstrate knowledge of how to use the DoD 8-Step Exposure Assessment Model Basic Characterization Step by stating the applicable OSHA and other standards.
5. Demonstrate knowledge of how to use the DoD 8-Step Exposure Assessment Model Characterize Exposures Step by describing typical evaluation techniques (sampling and workplace monitoring plans).
6. Demonstrate knowledge of how to use the DoD 8-Step Exposure Assessment Model Reporting/Recording Step by describing typical findings and recommendations (controls and medical surveillance).
7. Demonstrate knowledge of how to use the DoD 8-Step Exposure Assessment Model Reporting/Recording Step by describing how this data is entered/tracked using DOEHRS-IH.

Industrial Work Environments: Welding Processes (2hrs)

NOW AVAILABLE ONILINE at https://aiph-dohs.ellc.learn.army.mil

This course is self enrollment and self paced. The lecture has embedded multiple attempt knowledge checks. Passing score is 70%.

The purpose of this course is to provide a basic awareness of the different welding processes Occupational Health and Safety Professionals might encounter when inspecting/surveying worksites. Lessons provide explanations of basic welding terms, descriptions of different welding and cutting processes, a summary of hazards, illustrations of control measures, lists of applicable OSHA and other standards, and descriptions of sampling methods.

Terminal Learning Objectives:
TLO1. Demonstrate knowledge of how to use the DoD 8-Step Exposure Assessment Model to evaluate work-place environments for potential occupational health hazards. Stressors include but are not limited to confined space entry, spray painting, firing ranges, medical treatment facilities, welding, metal-working, foundries and general indoor environmental issues.
TLO2. Demonstrate knowledge of stressors to include but are not limited to confined space entry, spray painting, firing ranges, medical treatment facilities, welding, metal-working, foundries and general indoor environmental issues.

After completing this training, the student will be able to:
1. Demonstrate knowledge of stressors by recognizing common types of welding processes and equipment.
2. Demonstrate knowledge of stressors by recognizing hazards associated with welding processes.
3. Demonstrate knowledge of how to use the DoD 8-Step Exposure Assessment Model Basic Characterization Step by recognizing commonly found controls.
4. Demonstrate knowledge of how to use the DoD 8-Step Exposure Assessment Model Basic Characterization Step by stating the applicable OSHA and other standards.
5. Demonstrate knowledge of how to use the DoD 8-Step Exposure Assessment Model Characterize Exposures Step by describing typical evaluation techniques (sampling and workplace monitoring plans).
6. Demonstrate knowledge of how to use the DoD 8-Step Exposure Assessment Model Reporting/Recording Step by describing typical findings and recommendations (controls and medical surveillance).
7. Demonstrate knowledge of how to use the DoD 8-Step Exposure Assessment Model Reporting/Recording Step by describing how this data is entered/tracked using DOEHRS-IH.

Respiratory Protection (8hrs)

NOW AVAILABLE ONILINE at https://aiph-dohs.ellc.learn.army.mil

This course is self enrollment and self paced. The lecture has embedded multiple attempt knowledge checks.

The purpose of this course is to provide awareness of the Respiratory Protection that Occupational Health and Safety Professionals might encounter when inspecting/surveying worksites. This course consists of 6.5 hours of lecture with embedded knowledge checks. There are 9 lessons that follow each part of the OSHA standard. Certificates are awarded to participants who complete all 9 lessons with a minimum grade for each lesson of 70%.

1.What we need to know about PPE
2.General Respiratory Protection
3.Respiratory Protection Program
4.Types of Respiratory Protection
5.Filters/Cartridges
6.Protection Factors/Maximum Use Concentration
7.Fit Tests & Seal Checks
8.Recordkeeping
9.References

This monthly summary is published by the Industrial Hygiene Program Management Division for the Army Public Health Center.

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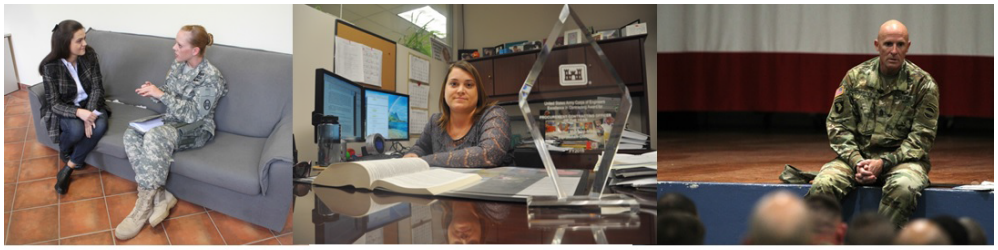
http://phc.amedd.army.mil/topics/workplacehealth/ih/Pages/default.aspx



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.