September 2021

Issue 120

Army Industrial Hygiene News and Regulatory Summary

Hazardous Substances

Almost 2 Million Lives Lost Annually to Workplace Exposures, WHO and ILO Estimate

Special Interest Articles:

- *Ventilation*
- *Communicating Performance*
- *Lead in Children*
- *Long Lasting Disinfectants*
- *Emergency Apps*

Work-related injuries and illnesses resulted in 1.9 million worker deaths worldwide in 2016, according to estimates recently released by the World Health Organization and International Labor Organization.

In a report issued Sept. 17, the organizations say the majority of the deaths were linked to cardiovascular or respiratory diseases. Workplace injuries accounted for 19% of the deaths, or around 360,000.

"It's shocking to see so many people literally being killed by their jobs," WHO Director-General Tedros Adhanom Ghebreyesus said in a press release. "Our report is a wake-up call to countries and businesses to improve and protect the health and safety of workers by honoring

their commitments to provide universal coverage of occupational health and safety services."

Read more:
https://www.safetyandhealthmagazine.com/articles/21768-almost-2-million-lives-lost-annually-to-workplace-exposures-who-and-ilo-estimate

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Hormonal Hazard: Chemicals Used in Paints and Plastics Can Promote Breast Tumor Growth

Photoinitiators are chemicals that release reactive molecules in response to UV radiation. Given these properties, photoinitiators are used in a wide range of products, including plastics, paints, inks, and adhesives. As a result, photoinitiators are present in several objects of everyday use as well as in medical products and instruments such as dental fillers and containers.

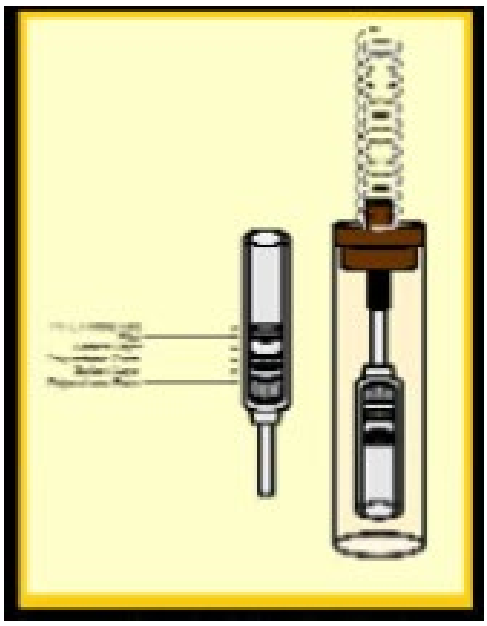
Recently, studies have demonstrated several health hazards associated with photoinitiators, raising alarms about their safety. In particular, the presence of these compounds in clinical instruments, routinely used for treating high-risk individuals such as cancer patients, has become a major cause for concern. Previous studies have shown that three photoinitiators commonly found in plastics and paints—1-HCHPK, MBB, and MTMP—show estrogen-like effects on cultured breast cancer cells, increasing their proliferation. Owing to the presence of these compounds in marketed injection solutions and the well-known link between estrogen activity and breast cancer, a thorough investigation of their effect on breast tumor growth is warranted.

Read more:
https://medicalxpress.com/news/2021-09-hormonal-hazard-chemicals-plastics-breast.html

Particle-Phase Collection Efficiency of the OVS and IFV Pro Personal Pesticide Samplers

The inhalable aerosol sampling criterion has been developed to characterize the efficiency of particles entering the nose and/or mouth. However, pesticides can exist in the air in both vapor and particulate phases, which complicates exposure assessments. The American Conference of Governmental Industrial Hygienists (ACGIH) has established an IFV (inhalable fraction and vapor) endnote for chemicals such as many pesticides that need to be evaluated for both their inhalable fraction and vapor concentrations to fully characterize worker exposures. The purpose of this study was to evaluate the particle-phase collection efficiency of a commonly-used pesticide sampler, the OSHA Versatile Sampler (OVS) as well as a recently developed sampler, the IFV Pro. The OVS was not designed as an inhalable aerosol sampler, whereas the IFV Pro contains a sampling head scaled to that of the Institute of Medicine (IOM) sampler, which is known to closely follow the inhalable sampling criterion.

Laboratory experiments involving a vertical-flow, low velocity scheme and finely graded test dusts with known median aerodynamic diameter were used to determine sampler collection efficiencies. The collection efficiency of the OVS was evaluated as recommended by the manufacturer and after two modifications made to potentially improve its collection efficiency. The OVS was found to substantially under-sample



relative to the inhalable criterion, and the two modifications did not provide substantial improvements to the original configuration. Conversely, the collection efficiency of the IFV Pro was found to compare closely to that of the IOM, although collecting 9% more mass. When applied side-by-side with the OVS sampler in a chamber into which ethylene glycol was sprayed as a proxy for a pesticide, the IVF Pro collected an average of 1.9-fold more mass than the OVS for the same flow rate and sample time.

Read more: Journal of Occupational and Environmental Hygiene, Accepted author version posted online: 06 Oct 2021 (Available with AIHA membership)

Combustion Products Generated in Simulated Industrial Fires

Studies of firefighter exposure to combustion products have focused predominantly on real or simulated residential structure fires, with few investigations considering industrial fire scenarios. This study measured the atmospheric concentrations of a variety of volatile organic compounds (VOCs), acid gases, and polycyclic aromatic hydrocarbons (PAHs) produced during fires in simulated industrial premises, as well as the deposition of PAHs onto the structural firefighting ensembles worn by the firefighters involved in extinguishment activities. Ingress of these combustion products into the structural firefighting ensembles during firefighting was also measured. Benzene concentrations of up to 23 mg/m3 and total PAH concentrations ranging from 1.7 to 8.6 mg/m3 were observed in personal air samples collected outside the structural firefighting ensembles, as well as a variety of acid gases including hydrogen chloride and hydrogen cyanide. Most combustion products detected outside the structural firefighting ensembles were also detected inside the ensembles, although often at much lower concentrations. The degree of protection observed was not uniform across all the combustion products investigated, with lower levels of protection found for gaseous combustion products such as benzene, xylene, hydrogen cyanide, and hydrochloric acid as compared with PAHs. Deposition of a variety of PAH compounds was observed on the outer surface of the structural firefighting ensembles, with total PAH concentrations ranging from 161 to 347 ng/cm2. While similar combustion products are involved in firefighter exposures during residential and industrial fires, deposition rates of PAHs, may be substantially higher during industrial firefighting. This research provides evidence supporting fireground decontamination measures for management of contamination of structural firefighting ensembles and equipment worn or carried by firefighters during firefighting activities. Further research is required to investigate the potential for dermal deposition of PAHs during actual industrial fire responses, and characterize which stages of fire and firefighting operations contribute the most to firefighters' exposure to particular contaminants.

Read more: Journal of Occupational and Environmental Hygiene, Accepted author version posted online: 03 Sep 2021, (Available with AIHA membership)

Indoor Chlorine Gas Release in a Natatorium: A Case Study

Pool chemicals are utilized in pools to inactivate pathogens, optimize pH, and increase water clarity. This is conducted to ensure public health and safety by reducing bacteria concentrations and allowing distressed swimmers to be detected underwater. In commercial recreational facilities, muriatic acid and gaseous CO2 are typically used to maintain pH. Chlorine, which can take the form of liquid or solid tablets of sodium hypochlorite or granular calcium hypochlorite, is used to sanitize pool water, and is the most commonly used chemical treatment in the world for disinfection of swimming pools. If chlorine is mixed with muriatic acid, chlorine gas is formed, which can lead to severe injuries and fatalities to exposed individuals (SIFs). This work illustrates an incident that occurred as a result of the simultaneous injection of muriatic acid and liquid sodium hypochlorite into a recreational natatorium chemical feed line. This led to the release of chlorine gas in the indoor environment, which resulted in injuries to five patrons.

Furthermore, strategies are proposed to prevent this from occurring and to reduce the likelihood of similar incidents in the future. These include the implementation of fail-safe logic to prevent the controller from malfunctioning and ensuring that controller program settings do not permit simultaneous chemical injection.

Read more: Journal of Occupational and Environmental Hygiene, Accepted author version posted online: 27 Sep 2021 (Available with AIHA membership)

Modeling the Impacts of Physical Distancing and Other Exposure Determinants on Aerosol Transmission

Minimization of airborne virus transmission has become increasingly important due to pandemic and endemic infectious respiratory diseases. Physical distancing is a frequently advocated control measure, but the proximity-based transmission it is intended to control is challenging to incorporate into generalized, ventilation-based models. We utilize a size-dependent aerosol release model with turbulent dispersion to assess the impact of direct, near-field transport in conjunction with changes in ventilation, exposure duration, exhalation/inhalation rates, and masks. We

demonstrate this model on indoor and outdoor scenarios to estimate the relative impacts on infection risk. The model can be expressed as a product of six multiplicative factors that may be used to identify opportunities for risk reduction. The additive nature of the short-range (proximity) and long-range (background) transmission components of the aerosol transport factor implies that they must be minimized simultaneously. Indoor simulations showed that close physical distances attenuated the impact of most other risk reduction factors. Increasing ventilation resulted in a 17-fold risk decrease at further physical distances but only a 6-fold decrease at shorter distances. Distance, emission rate, and duration also had large impacts on risk (11–65-fold), while air direction and inhalation rate had lower risk impacts (3–4-fold range). Surgical mask and respirator models predicted higher maximum risk impacts (33- and 280-fold, respectively) than cloth masks (4-fold). Most simulations showed decreasing risk at distances > 1–2 m (3–6 ft). The risk benefit of maintaining 2-m distance vs. 1 m depended substantially on the environmental turbulence and ventilation rate. Outdoors, long-range transmission was negligible and short-range transmission was the primary determinant of risk. Temporary passing events increased risk by up to 50 times at very slow walking speeds and close passing distances, but the relative risks outdoors were still much lower than indoors. The current model assumes turbulent dispersion typical of a given room size and ventilation rate. However, calm environments or confined airflows may increase transmission risks beyond levels predicted with this turbulent model.

Read more: Journal of Occupational and Environmental Hygiene, Published online: 13 Sep 2021 (Available with AIHA membership)

Radiation

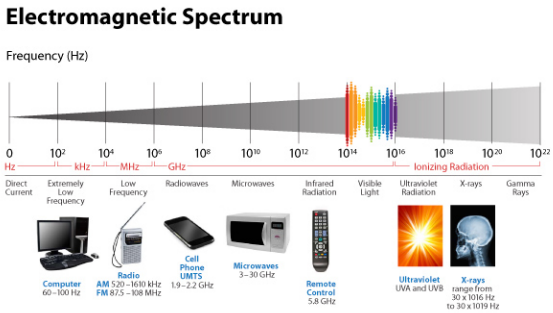
Sunlight Exposure Guidelines May Need to Be Revised, Researchers Warn

Previously published solar exposure guidelines for optimal vitamin D synthesis based on a study of skin samples may need to be revised, according to new research published today in *PNAS*.

A study by researchers from King's College London, with support from the NIHR Guy's and St Thomas' Biomedical Research Centre, has tested the optimum ultraviolet radiation (UVR) wavelengths for human skin production of vitamin D in sunlight. UVR from sunlight can cause sunburn and skin cancer, however, it is the most important source of vitamin D that is essential for healthy bone development and maintenance.

Read more:
https://medicalxpress.com/news/2021-09-sunlight-exposure-guidelines.html

TEI-REX Program Will Change How We Measure Exposures to Ionizing Radiation



Most biodosimetry approaches rely upon calculating damage done to DNA or the downstream effects of irradiative damage.

The goal of the Targeted Evaluation of Ionizing Radiation Exposure (TEI-REX) program, a research and development effort from the Department of Defense Intelligence Advanced Research Projects

Activity (IARPA), is to establish novel biodosimetry approaches to effects from low-dose radiation done to other biological components, specifically those which are long lasting and directly attributable to the initial ionizing insult. Sample types targeted include skin, hair, nails, sweat, natural surface oils, saliva, dermal interstitial fluid, and/or mucosal cells from the mouth.

Read more:
https://globalbiodefense.com/2021/09/18/tei-rex-program-will-change-how-we-measure-exposures-to-ionizing-radiation/

Ventilation

Many Ventilation Systems May Increase Risk of COVID-19 Exposure, Study Suggests

Ventilation systems in many modern office buildings, which are designed to keep temperatures comfortable and increase energy efficiency, may increase the risk of exposure to the coronavirus, particularly during the coming winter, according to research published in the *Journal of Fluid Mechanics*.

A team from the University of Cambridge found that widely-used 'mixing ventilation' systems, which are designed to keep conditions uniform in all parts of the room, disperse airborne contaminants evenly throughout the space. These contaminants

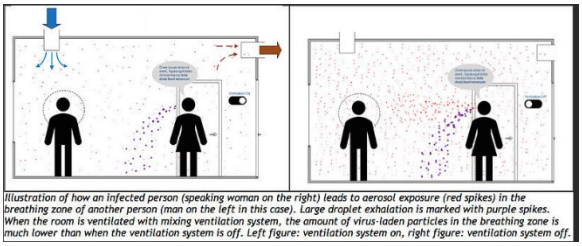


Illustration of how an infected person (speaking woman on the right) leads to aerosol exposure (red spikes) in the breathing zone of another person (man on the left in this case). Large droplet exhalation is marked with purple spikes. When the room is ventilated with mixing ventilation system, the amount of virus-laden particles in the breathing zone is much lower than when the ventilation system is off. Left figure: ventilation system on, right figure: ventilation system off.

may include droplets and aerosols, potentially containing viruses.

Read more:
https://www.sciencedaily.com/releases/2020/09/200929130301.htm

PPE

Persistence of SARS-Co-V-2 on N95 Filtering Facepiece Respirators: Implications for Reuse

In response to the shortage of N95 filtering facepiece respirators for healthcare workers during the COVID-19 pandemic, the Centers for Disease Control and Prevention issued guidance for extended use and limited reuse of N95 FFRs to conserve supply. Previously worn N95 filtering facepiece respirators can serve as a source of pathogens, which can be transferred to the wearer while doffing and donning a respirator when practicing reuse. When practicing limited filtering facepiece respirators reuse, to reduce the risk of self-contamination, the Centers for Disease Control and Prevention recommends storing filtering facepiece respirators for five days between uses to allow for the decay of viable pathogens including SARS-CoV-2. This study assesses the persistence of the SARS-CoV-2 strain USA-WA1/2020 on N95 filtering facepiece respirators under controlled storage conditions for up to five days to inform the Centers for Disease Control and Prevention guidance. Coupons excised from six N95 filtering facepiece respirator models and glass slide coverslips were inoculated with the virus in a defined culture medium and in human saliva and stored at 20 °C and 20%, 45%, and 75% relative humidity. Statistically significant differences in SARS-CoV-2 half-lives were measured among the tested humidity levels with half-lives decreasing from an average of approximately 30 hours at 20% relative humidity to approximately 2 hours at 75% relative humidity. Significant differences in virus half-lives were also observed between the culture medium and saliva suspension media at 20% and 45% relative humidity with half lives up to 2.9 times greater when the virus was suspended in cell culture medium. The five-day storage strategy, assessed in this study, resulted in a minimum of 93.4% reduction in viable virus for the most challenging condition (20% relative humidity, cell culture medium) and exceeding 99% reduction in virus at all other conditions.

Read more: Journal of Occupational and Environmental Hygiene, Accepted author version posted online: 27 Sep 2021 (Available with AIHA membership)

Noise

Testing 1-2: New Laser-Based Microphone Calibration Measures Up

Researchers at the National Institute of Standards and Technology (NIST) have conducted the first demonstration of a faster and more accurate way to calibrate certain kinds of microphones.
The technique, which uses lasers to measure the velocity at which a microphone's diaphragm vibrates, performs well enough to overtake one of the main calibration methods used at NIST and throughout industry. Someday, a laser-based method could be commercialized to become a completely new way to do extremely sensitive, low-uncertainty calibrations of microphones in the field, in places such as factories and power plants. Potential users of such a commercial system could include organizations that monitor workplace or community noise levels or the condition of machinery via sound.

Read more: https://www.nist.gov/news-events/news/2021/09/testing-1-2-new-laser-based-microphone-calibration-measures

Preventive Medicine

Communicating Performance to Increase Industrial Hygiene Program Engagement

If you were to ask business managers about the status of their business, they would discuss their profit margin, EBITA, percent growth in revenue or other common financial metrics. Ask a safety manager the same question and he

or she would probably let you know about the number of days without a recordable injury or incident rate and how it compares with last year. But for those handling industrial hygiene, the answer to the question, "What is the status of your industrial hygiene program?" gets more complicated. Would they pull up a bunch of statistics? A list of SEGs? Perhaps, they would show their sampling plan for the year?

That is because identifying the best industrial hygiene (IH) data points, statistics, tables or diagrams that demonstrate the status of your program is hard. It's been a long-running challenge for those handling IH and is believed to be a big reason why most stakeholders don't understand what IH is or the value it brings to the business. Let's look at some ways you can effectively communicate the status and value of your IH program to both workers and management to help strengthen engagement and buy-in.

Read more: https://ohsonline.com/articles/2021/09/01/communicating-performance-industrial-hygiene.aspx?admgarea=news

New Computational Approach May Predict How Individuals Are Likely to Respond to Vaccines

In an advance that sheds light on why certain vaccines may influence people differently, a new computational approach developed at the University of Michigan may predict how individual patients are likely to respond.

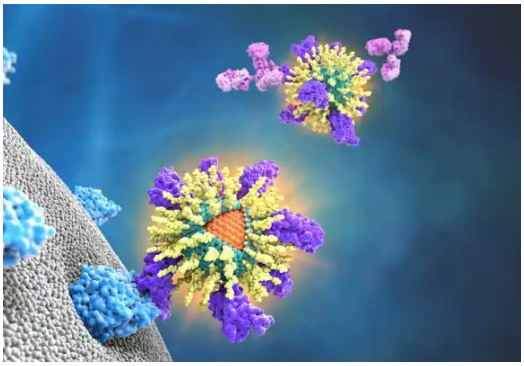
In the future, it could lead to new design principles for vaccines that take an individual's personalized characteristics into account, possibly enabling vaccines for HIV and more effective protection from the flu.

"Different people vary in the amount and type of antibodies they produce," said Kelly Arnold, U-M assistant professor of biomedical engineering and a corresponding author on a new study published in Cell Reports Medicine.

"Depending on their genetics, they also have different protein sequences in their antibodies and immune cell receptors that cause them to bind differently."

Read more: https://www.news-medical.net/news/20210902/New-computational-approach-may-predict-how-individuals-are-likely-to-respond-to-vaccines.aspx

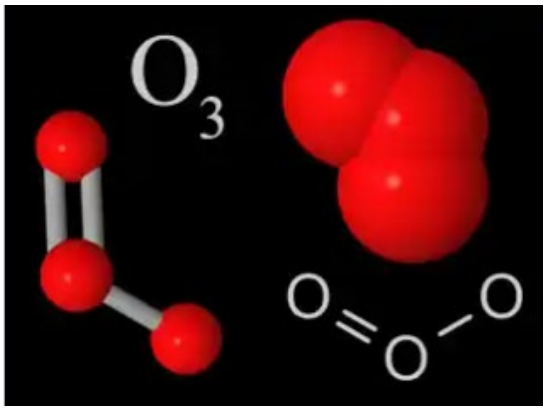
In Vitro Virucidal Efficacy of a Dry Steam Disinfection System against Human Coronavirus, Human Influenza Virus and Echovirus



This *in vitro* study was aimed to assess the efficacy of dry steam in inactivating Human Coronavirus OC43 (HCoV-OC43) as surrogate of SARS-CoV-2, Human Influenza Virus A/H1N1/WSN/33 and Echovirus 7 on stainless steel, polypropylene and cotton. The virus models were chosen on the basis of their transmission route and environmental resistance. Tests were carried out under a laminar flow cabinet, where two panels of each material were contaminated with a viral suspension. The inocula were left to dry and then the virus on untreated panel (control) was collected by swabbing in order to determine the initial titer. The other panel was treated using a professional vacuum cleaner equipped with a dry steam generator. Dry steam is generated in a boiler where tap water is heated up to 155 °C at 5.5 bar pressure and then during the passage along the flexible hose the temperature decreases to a value between 100 °C and 110 °C at the output. The dry steam was applied for four sec with a window wiper on metal and plastic panels or a brush covered by a microfiber cap on cotton, simulating the steam application during routine cleaning. After the treatment, infectious virus possibly remained on the surface was collected following the same swabbing procedure applied for controls. HCoV-OC43 and Echovirus 7 were titrated by end-point method on HCT-8 line cells and Vero cells, respectively, while Human Influenza Virus was quantified by plaque reduction assay on MDCK cells. Dry steam resulted effective against the three viruses on all tested materials, achieving a mean Log_{10} reduction factor ≥4 in viral titer of treated samples compared with controls according to UNI EN 14476:2019. Thus, dry steam may be proposed as an ease to use, effective, fast and non-toxic alternative to chemicals for surface disinfection without damaging materials. Therefore, this device could be employed not only in healthcare facilities but also in occupational, domestic and community settings, with advantages for environment and human health.

Read more: Journal of Occupational and Environmental Hygiene, Accepted author version posted online: 12 Oct 2021 (Available with AIHA membership)

Research Shows Ozone as a Potential Disinfectant Agent in Public Transport



The Hydrens team of researchers developed a numerical model that estimates the ozone concentration needed to meet the disinfection criteria. To do this, it takes into account the geometry and volume of the space to be treated, the type of materials inside it and their capacity to absorb ozone, and the characteristics of the impulsion-distribution system used.

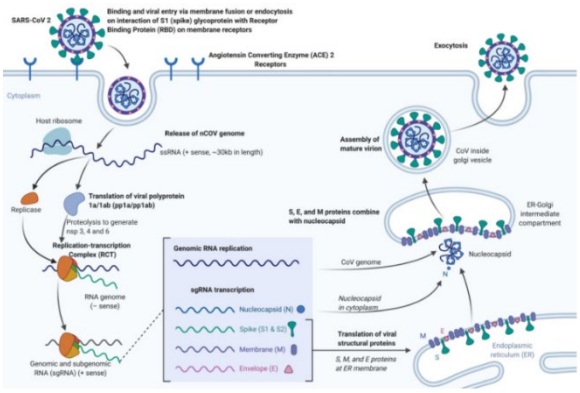
The model was validated through several tests, both in the laboratory and in metro and tram wagons –which were provided by Ferrocarrils de la Generalitat Valenciana, the Valencian Government railway company. An ozonisation system was installed in them that injected more and more gas, until it reached the concentration determined by the model. A catalyst for the decomposition of the residual ozone was installed too, in order to preventing its emission into the atmosphere.

Read more: https://www.news-medical.net/news/20210924/Research-shows-ozone-as-a-potential-disinfectant-agent-in-public-transport.aspx

DNA Sensor Can Detect Infectious Viruses in Minutes

A new sensor can detect not only whether a virus is present, but whether it's infectious – an important distinction for containing viral spread.

Researchers at the University of Illinois Urbana-Champaign and collaborators developed the sensor, which integrates specially designed DNA fragments and nanopore sensing, to target and detect infectious viruses in minutes without the



need to pre-treat samples. They demonstrated the sensor's power with two key viruses that cause infections worldwide: the human adenovirus and the virus that causes COVID-19.

Yi Lu, a professor emeritus of chemistry, and Benito Marinas, a professor of civil and environmental engineering, co-led the work with University of Illinois Chicago professor Lijun Rong; professor Omar Azzaroni, of the National University of La Plata in Argentina; and María Eugenia Toimil-Molares, of the GSI Helmholtz Centre for Heavy Ion Research in Germany. They reported their findings in the journal Science Advances.

Read more: https://www.news-medical.net/news/20210923/DNA-sensor-can-detect-infectious-viruses-in-minutes.aspx

Medical Surveillance vs Medical Screening

When companies are asked why they do medical screening or medical surveillance the typical answer is, “Because we have to.” Often, this is the correct answer, as OSHA and other regulatory agencies require medical surveillance and/or screening programs for certain workplace exposures. Companies across the United States spend a lot of money on these programs and the cost is on the rise. Unfortunately, many of them fail to manage their programs effectively, resulting in widespread failure to actually identify, reduce or eliminate hazards before serious damage is done to their employees, or until serious liability occurs. The best approach to prevent this and to realize the actual benefit of these programs is for companies to fully understand the program objectives and to have a working knowledge of the program’s complexities which takes a multi-disciplinary team of internal and external contributors.

Read more: https://ohsonline.com/articles/2021/09/01/medical-surveillance-vs-medical-screening.aspx?admgarea=news

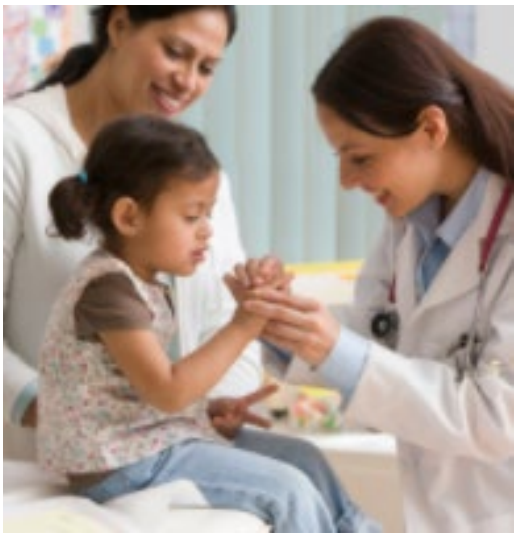
Environmental Health

Study Links Air Pollution to Nearly 6 Million Preterm Births around the World

Air pollution likely contributed to almost 6 million premature births and almost 3 million underweight babies in 2019, according to a UC San Francisco and University of Washington global burden of disease study and meta-analysis that quantifies the effects of indoor and outdoor pollution around the world.

Read more:
https://medicalxpress.com/news/2021-09-links-air-pollution-million-preterm.html

Lead Contamination Found in Blood of Half of Young Kids in U.S.



About half of young children who were tested for lead had detectable levels of the toxic metal in their blood, according to a new study published in the peer-reviewed journal *JAMA Pediatrics* on Monday. While most of the kids had relatively smaller amounts, about 2% had a level that is considered high. The research tracked more than 1.1 million children under the age of 6 years who underwent lead testing from October 2018 through February 2020.

Read more:
https://medicalxpress.com/news/2021-09-contamination-blood-young-kids.html

Study Finds Strong Association between PM2.5 and Neurological Disorders

A comprehensive, systematic meta-analysis conducted by HKBU scientists found a significant association between exposure to PM2.5, i.e., fine particulates with equivalent diameters of less than 2.5 microns suspended in the air, and neurological disorders. These include stroke, dementia, Alzheimer's disease, Parkinson's disease and autism spectrum disorder (ASD). Neurological disorders are the leading cause of disability and the second leading cause of death worldwide, posing serious challenges to global health.

Read more: https://medicalxpress.com/news/2021-09-strong-association-pm25-neurological-disorders.html

Water Coolers Can Release Potentially Harmful Compounds into Drinking Water

Watercoolers have become a staple in homes, offices and schools, but their tanks and parts are made of materials that could release unwanted or potentially harmful compounds into drinking water. In a preliminary study, researchers in ACS' Environmental Science & Technology Letters report that organophosphate esters (OPEs) were found in water dispensed from these systems, but they estimated that daily consumption would be far below the levels associated with health problems.

As drinking water from freestanding dispensers has become wildly popular, some concern has been raised about the quality of the water coming out of these systems.

Read more: https://scitechdaily.com/water-coolers-can-release-potentially-harmful-compounds-into-drinking-water/

A Novel Cell Sensor for Rapid and Low-Cost Screening of Drug-Resistant Bacteria

A research team led by scientists at Hong Kong Baptist University (HKBU) has developed a novel cell sensor with a barcode-like micro-channel structure that enables rapid and low-cost screening of drug-resistant bacteria. The invention could potentially be used on a large-scale in resource-limited situations such as frequent safety screenings of water, food and public facilities, as well as urgent surveys of massive samples during an infectious disease outbreak, particularly in developing countries.

A research paper on the novel invention was published in the international academic journal Biosensors and Bioelectronics (""“Barcode” cell sensor microfluidic system: Rapid and sample-to-answer antimicrobial susceptibility testing applicable in resource-limited conditions").

Read more: https://www.nanowerk.com/nanotechnology-news2/newsid=58844.php

Ergonomics

The Changing Occupation Landscape: How Automation Affects Workers Health and Mortality

A study on how structural economic risk at the occupational level is linked to long-term health outcomes of employees found that individuals in occupations characterized by high routine intensity are likely to become unemployed in the long term and have higher rates of disability and mortality,

according to researchers at the Robert N. Butler Columbia Aging Center based at Columbia University Mailman School of Public Health. Until now, there has been a lack of large-scale population level analyses focusing on how one's job is affected by technology- induced displacement and its health and social effects. The findings are published online in the journal *Occupational and Environmental Medicine.*

Read more:
https://medicalxpress.com/news/2021-09-occupation-landscape-automation-affects-workers.html

Safety

Managing Combustible Dust and Risk Mitigation

To determine the most effective combustible dust hazard mitigation approach for new and existing dust collection system installations, a dust hazard analysis (DHA) conducted by a qualified person should be performed.

NFPA 652: Standard on the Fundamentals of Combustible Dust defines a qualified person as, "A person who, by possession of a recognized degree, certificate, professional standing, or skill, and who, by knowledge, training, and experience, has demonstrated the ability to deal with problems related to the subject matter, the work, or the project." For a DHA to be effective, it must analyze all the potential fire, deflagration and explosion scenarios associated with the process and connected

ventilation system. The hazards associated with combustible dusts are complex.

Read more:
https://ohsonline.com/articles/2021/09/01/managing-combustible-dust-and-risk-mitigation.aspx?admgarea=news

Long-Lasting Disinfectant Protects Against Viruses for Up to 7 Days – Promises to Help Fight Pandemics

An alum and several researchers at UCF have used nanotechnology to develop the cleaning agent, which protects against seven viruses for up to seven days.

UCF researchers have developed a nanoparticle-based disinfectant that can continuously kill viruses on a surface for up to seven days – a discovery that could be a powerful weapon against COVID-19 and other emerging pathogenic viruses.
The findings, by a multidisciplinary team of the university's virus and engineering experts and the leader of an Orlando technology firm, were published this week in *ACS Nano*, a journal of the American Chemical Society.

Read more: https://scitechdaily.com/long-lasting-disinfectant-protects-against-viruses-for-up-to-7-days-promises-to-help-fight-pandemics/

Toolkit Aimed at Curbing Health Decline among Correctional Workers

Noting that corrections officers have an average life expectancy that's 16 years less than other occupational groups, the Center for the Promotion of Health in the New England Workplace has created a mentoring toolkit aimed at combating a decline in health early in correctional workers' careers.

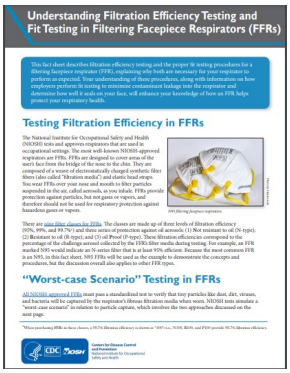
CPH-NEW is one of NIOSH's Centers of Excellence for Total Worker Health. From 2006 to 2011, the center's Health Improvement Through Employee Control study documented a steady progression of disease risk factors during the first five

years of employment among corrections officers, leading to physical inactivity, obesity, high levels of depression, and poor sleep and nutritional habits. The Total Worker Health Mentoring Toolkit for Corrections Personnel, available to download for free, is designed to be used by correctional organizations to organize a

Total Worker Health mentoring program, recruit and train members, and evaluate the program.

Read more:
https://www.safetyandhealthmagazine.com/articles/21753-toolkit-aimed-at-curbing-health-decline-among-correctional-workers

N95 Respirator Approval, Fit Testing and Efficiency: New Fact Sheets from NIOSH


Understanding Filtration Efficiency Testing and Fit Testing in Filtering Facepiece Respirators (FFRs)

Testing Filtration Efficiency in FFRs

"Worst-case Scenario" Testing in FFRs

NIOSH has issued a pair of fact sheets on filtering facepiece respirators, detailing how to tell if an N95 is approved by the agency as well as procedures for fit testing and testing filtration efficiency.

With an NIOSH-approved respirator, "you can be confident that it is working as expected" as long as it is properly maintained, is worn and used correctly, fits properly, and is replaced as recommended by the manufacturer.

"NIOSH only approves respirators that pass its strict quality assurance and performance requirements," the agency says. During its tests, NIOSH uses a "near worst-case penetrating aerosol size (i.e., particles that are best able to make it through a filter)." An N95 respirator must block at least 95% of those particles, which typically measure at 0.3 microns in diameter.

Read more:
https://www.safetyandhealthmagazine.com/articles/21747-n95-respirator-approval-fit-testing-and-efficiency-new-fact-sheets-from-niosh

Smartphone Sensors Are Capable of Detecting Cannabis High and Have the Potential to Provide Early Intervention

Smartphone sensors are used daily to detect time and travel, but when those two factors are combined, researchers found that these sensors can also detect a cannabis high.

The study, published in the advanced online November 2021 issue of Drug and Alcohol

Dependence, was led by Stevens' assistant professor Sang Won Bae. Bae has previously developed machine-learning models in detecting binge drinking using the co-developed smartphone app.

"Smartphones with mobile sensors are universal and can track our behavior in an unobtrusive way," Bae said. "They are not a distraction, you don't have to wear them, and the data they collect can potentially prevent poor decision-making when under the influence."

Read more:
https://www.eurekalert.org/news-releases/930122

Emergency Preparedness

7 Smartphone Apps for Emergencies That You Need to Download Right Now

Want to be notified if there's a tornado coming your way, or need a way to communicate with others if cell phone towers are down? These emergency and weather apps can help you stay safe.
Are you a weather junkie? Does the crackly, staticky sound of an emergency NOAA weather alert prick up your ears and set your pulse racing? Of course, even those who aren't transfixed by the troposphere or mesmerized by millibars have a big stake in knowing when an adverse weather event might strike. When it comes to natural disasters, the best approach is an abundance of caution. Take a page from the Boy Scouts Handbook and be prepared, starting with this rundown of the best emergency and weather apps to download right now.

Read more:
https://www.bobvila.com/slideshow/7-smartphone-apps-for-emergencies-that-you-need-to-download-right-now-580580

Deployment Health

Ft. Bragg Airborne Troops Support R&D to Prevent Soldier Head Injuries

Airborne Soldiers here recently tested combat helmet sensors looking to help the Army lessen repetitive traumatic injuries to the head and neck while jumping from aircraft.

The 2nd Brigade, 82nd Airborne Division and the Airborne and Special Operations Test Directorate teamed up to do testing for the Army Research Laboratory's (ARL) newest Head Impact Monitoring Sensors. Ongoing research supported by the ARL over the last 10 years has developed improved monitoring devices and the implementation of many new protective gear developments.

Read more:
https://www.army.mil/article/250153/ft_bragg_airborne_troops_support_rd_to_prevent_soldier_head_injuries

Nanotechnology

AI-Driven Dynamic Nanofiber Face Mask Adapts to Exercise, Pollution Levels

During the coronavirus pandemic, many people have grown accustomed to wearing face masks to protect themselves and others, but that doesn't mean the masks are always comfortable — especially during exercise. Now, researchers reporting in ACS Nano ("Dynamic Pore Modulation of Stretchable Electrospun Nanofiber Filter for Adaptive Machine Learned Respiratory

Protection") have developed a dynamic respirator that modulates its pore size in response to changing conditions, such as exercise or air pollution levels, allowing the wearer to breathe easier when the highest levels of filtration are not required.

Read more:
https://www.nanowerk.com/nanotechnology-news2/newsid=58848.php

Regulatory Research & Industrial Hygiene Professional News

State Law

New California Law Expands Protections for Warehouse Workers

On September 22, 2021, California Governor Gavin Newsom signed into law a groundbreaking bill that affects warehouse distribution centers ("covered employers") and their employees.

Effective January 1, 2022, AB 701, requires covered employers to provide nonexempt employees with a written description of each quota that the employee is subject to, including the number of tasks to be performed, or materials to be produced or handled, and any potential adverse employment action that could result from failure to meet the quota. The disclosures

must be made at the time of hire, or within 30 days of the effective date of the law.

Read more:
https://www.jdsupra.com/legalnews/california-passes-law-marking-a-7882726/

DOL

US Department of Labor Announces Enhanced, Expanded Measures to Protect Workers from Hazards of Extreme Heat, Indoors and Out

To combat the hazards associated with extreme heat exposure – both indoors and outdoors – the White House today announced enhanced and expanded efforts the U.S. Department of Labor is taking to address heat-related illnesses.

As part of the Biden-Harris administration's interagency effort and commitment to workplace safety, climate resilience, and environmental justice, the department's Occupational Safety and Health Administration is initiating enhanced measures to protect workers better in hot environments and reduce the dangers of exposure to ambient heat.

While heat illness is largely preventable, and commonly under-reported, thousands of workers are sickened each year by workplace heat exposure. Despite widespread under-reporting, 43 workers died from heat illness in 2019, and at least 2,410 others suffered serious injuries and illnesses.

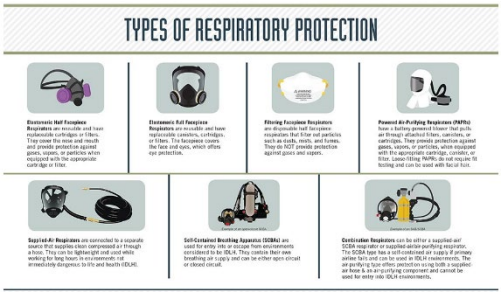
Read more:
https://www.dol.gov/newsroom/releases/osha/osha20210920

NIOSH

Who Does What? The Roles of NIOSH, OSHA, and the FDA in Respiratory Protection in the Workplace

Over the years, the National Institute for Occupational Safety and Health (NIOSH) has built complex partnerships with the Occupational Safety and Health Administration (OSHA) and the Food and Drug Administration (FDA) to address the

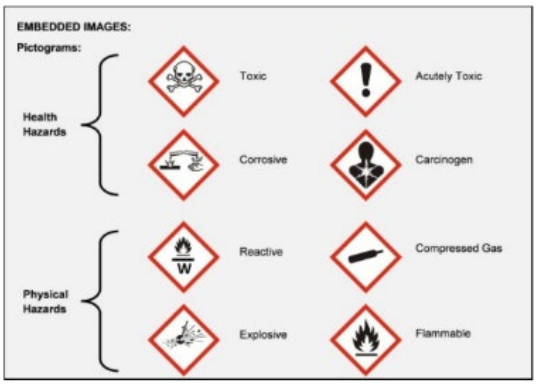
specific respiratory protection needs of workers in different industries. Each of these federal organizations is dedicated to ensuring that workers who rely on respiratory protection have the necessary tools to stay protected. Understanding "who does what" can help a respiratory protection manager and respirator users understand where to find the information that they need.



Read more: https://blogs.cdc.gov/niosh-science-blog/2021/09/09/respirator_roles/

OSHA

OSHA Holds Public Hearing on Proposed Amendments to the Hazard Communication Standard



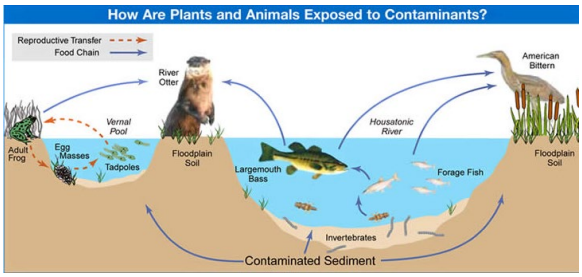
The HCS is the federal-level regulation that sets forth the classification, labeling, Safety Data Sheet (SDS), and training requirements for hazardous chemicals intended to be used, handled, or stored in workplaces. The current HCS is based on the third revised edition (Rev 3) of the United Nations (UN) Globally Harmonized System of Classification and Labeling of Chemicals (GHS). The proposed changes include many significant changes intended to update the HCS to align with the seventh revised edition (Rev 7) of GHS. The transition period proposed is one year for chemical manufacturers, importers, and distributors of substances and two years for chemical manufacturers, importers, and distributors of mixtures after the effective final rule is published.

Read more: https://www.natlawreview.com/article/osha-holds-public-hearing-proposed-amendments-to-hazard-communication-standard

EPA

EPA Plans New Rulemaking for PBTs , Extends Compliance Dates for PIP (3:1) Rule

The U.S. Environmental Protection Agency (EPA) announced on September 3, 2021, that it intends to initiate a new rulemaking and anticipates proposing new rules for five persistent, bioaccumulative, and toxic (PBT) chemicals that are the subject of final risk management rules under the Toxic Substances Control Act (TSCA). Additionally, and importantly, EPA is extending the compliance dates for the prohibitions on processing and distribution and the associated recordkeeping requirements of one of these PBT chemicals, phenol, isopropylated phosphate (3:1) (PIP (3:1)). The action is imperative as the current No



Action Assurance (NAA) was set to lapse tomorrow at 11:59 p.m.

Read more:
https://www.natlawreview.com/article/epa-plans-new-rulemaking-pbts-extends-compliance-dates-pip-3-1-rule

EPA Announces Plans for New Wastewater Regulations, Including First Limits for PFAS, Updated Limits for Nutrients

Today, the U.S. Environmental Protection Agency (EPA) released *Preliminary Effluent Guidelines Program Plan 15* (Preliminary Plan 15), which identifies opportunities to better protect public health and the environment through regulation of wastewater pollution. Preliminary Plan 15 announces that EPA will undertake three new rulemakings to reduce contaminants including PFAS and nutrients—from key industries.

Read more:
https://www.epa.gov/newsreleases/epa-announces-plans-new-wastewater-regulations-including-first-limits-pfas-updated

APHC

Training

As we continue to combat the COVID-19 virus, we are making our best efforts to provide you with Blueprint, Design Review, and Ventilation lessons that otherwise you'd travel to acquire.

Due to the changing MS TEAMS and DCS environments, and the ability to host a live event with hundreds of participants, we've been providing "Pre-recorded" webinar events.

All handouts are made available, and can be downloaded from your Blackboard webinar course shell with recorded material for you to view ad-hoc, and participation certificates awarded for each lesson survey/evaluation completed.

You may ask yourself "what's the difference between a live webinar and a pre-recorded webinar?"

Not only does a pre-recorded webinar allow you to view in your own time zone at a time most convenient for you, it allows us to edit and re-record segments, swap out segments that didn't work so well, add effects, graphics, and more in the post-production stage.

Pre-recorded webinars give a more polished effect than a live webinar. Right now, we're all adjusting to having more remote meetings, watching broadcasts instead of attending live events, and spending a little more time on our computers than doing surveys.

It is our goal to connect with you, getting you the relevant and emerging information you need to help your clients. Our sustainment webinars, whether live or pre-recorded, can help you achieve those goals.

How to participate in a "pre-recorded" webinar:

1. Navigate to your "Army Industrial Hygiene Webinar" shell on our Blackboard site https://aiph-dohs.ellc.learn.army.mil
2. Use the left navigation tile to locate SPECIAL EDITION WEBINARS
3. Select each webinar link to view
4. Record case sensitive code words while viewing
5. Use the left navigation tile to locate COLLECT CERTIFICATES
6. Select the link for your webinar and use code word to initiate certificate

NOTE: Our classroom space is not allowing traditional classroom courses due to the pandemic. We continue our efforts to provide relevant content that aligns with these courses via our webinars.


DOCUMENT LIBRARY
COLLECT CERTIFICATES
NEW WEBINARS
ASK THE SME RECORDINGS
MANAGE YOUR IH MONSTER RECORDINGS
ARMY IH FEILD OP MANUAL RECORDINGS
IH LEADER RECORDINGS
SPECIAL EDITION WEBINAR RECORDINGS
All slide handouts are here
Most recent recordings here
SME recording archive
MONSTER recording archive
FOM recording archive
LEADER recording archive
Special Edition archive


ABOUT THE "ASK THE SME" WEBINARS
These "Ask the SME" Webinars are about communicating freely with subject matter experts.
Most of the subject matter experts have lead in slides to spark conversation, and then take questions from the live a
If you are here, then you probably missed the live event. That's OKAY. This is why we provide recordings.
If you have questions for the subject matter experts that
ot addressed during the live event, we encourage yo
Description
SLIDE HANOUTS: Ask the SME Webinars
Enabled: Statistics Tracking
Attached Files:
11/4/2016 Monster: All About ANOVA (1.918 MB)
11/14/2018 SME: Hexavalent Chromium 48min (451.598 KB)
2/27/2019 SME: Ergonomics 51min (402.939 KB)
8/6/2019 SME: Pharmacy Hazardous Drug Samples 28min (1.569 MB)
3/4/2020 SME: APHC Analytical Lab (1.425 MB)
6/17/20 SME: IH Contract Technical Monitors (1.0hr) (773.407 KB)
OWAS Table.doc (90.5 KB)
Liberty Mutual Tables.pdf (874.9 KB)
OWAS Postures.pdf (135.149 KB)
12/2/20 SME: DOEHRS-IH Report Standardization 90min
Example Standardized Ergo Survey (4.361 MB)
Handouts
Download Handouts
Recordings
12/2/20 SME: DOEHRS-IH Report Standardization 90min
Enabled: Statistics Tracking
Look for slide handouts and a copy of the Army DOEHRS IH Buddy v0.7 in the SLIDE HANDOUTS above, or the DOCUMENT LIBRARY section of this course
12/2/20 SME: Downdraft Ventilation Q/A 7min
Enabled: Statistics Tracking

Downdraft Day	
12/2/20 Monster: Building Downdraft Tables in DOEHRS-IH (52min)	THEME: CONTROLING AIR CONTAMINANTS
12/2/20 Leader: Measuring Downdraft Tables (42min)	THEME: CONTROLING AIR CONTAMINANTS
12/2/20 SME: Downdraft Ventilation Q/A	THEME: CONTROLING AIR CONTAMINANTS
12/2/20 SME: DOEHRS-IH Report Standardization (30min)	THEME: MANAGING ARMY IH
12/2/20 Leader: Compressed Air use with Heavy Metals (30min)	THEME: CONTROLING AIR CONTAMINANTS

Vehicle Maintenance Day	
3/3/21 Monster: Building Vehicle Exhaust Ventilation in DOEHRS-IH (72min)	THEME: CONTROLING AIR CONTAMINANTS
3/3/21 Leader: Measuring Vehicle Exhaust Ventilation (50min)	THEME: CONTROLING AIR CONTAMINANTS
3/3/21 Leader: Vehicle Design Review (2hr)	THEME: CONTROLING AIR CONTAMINANTS
3/3/21 SME: Vehicle Exhaust Ototoxins (40min)	THEME: CONTROLING AIR CONTAMINANTS
3/3/21 SME: IH Manpower Study Survey (14min)	THEME: MANAGING ARMY IH

Coating/Painting Day	
6/2/2021 Monster: Building Paint Booths in DOEHRS-IH (60min)	THEME: CONTROLING AIR CONTAMINANTS
6/2/2021 Leader: Measuring Paint Booths (37min)	THEME: CONTROLING AIR CONTAMINANTS
6/2/2021 Leader: Paint Spray Design (65min)	THEME: CONTROLING AIR CONTAMINANTS
6/2/2021 SME: Data Mining DOEHRS-IH (Paintbooth Accident Investigation) (17min)	THEME: CONTROLING AIR CONTAMINANTS
6/2/2021 SME: DOEHRS Cadmium Data/Protecting Against Cadmium 49min	THEME: CONTROLING AIR CONTAMINANTS
6/2/2021 SME: Protecting Against Cadmium (combined with Cadmium Data)	THEME: CONTROLING AIR CONTAMINANTS
6/2/2021 Leader: Particle Size Selective Sampling 35min	THEME: SAMPLING
6/2/2021 Leader: IH Professional Sampling Kit 20min	THEME: SAMPLING
6/2/2021 SME: Surface Sampling 18min	THEME: SAMPLING

Laboratory/Healthcare Day	
9/1/2021 Monster: Building Lab Hood Ventilation in DOEHRS-IH (64min)	THEME: CONTROLING AIR CONTAMINANTS
9/1/2021 Monster: Building Dilution Ventilation in DOEHRS-IH (93min)	THEME: CONTROLING AIR CONTAMINANTS
9/1/2021 Leader: IH Value Strategy Laboratory Engineering Controls (17min)	THEME: CONTROLING AIR CONTAMINANTS
9/1/2021 SME: Sampling Qualifiers (15min)	THEME: SAMPLING
9/1/2021 Leader: Laboratory Design (2hr)	THEME: CONTROLING AIR CONTAMINANTS
9/1/2021 Leader: Methylene Chloride (Workplace, Data Mining, Virtual Tour) (2hr)	THEME: SAMPLING
9/1/2021 Leader: Healthcare Ventilation and Design (3hr)	THEME: CONTROLING AIR CONTAMINANTS
9/1/2021 Leader: OHS for Laboratory/Healthcare (Overview, Risk Management, IH Role, Virtual Tours) (3hr)	THEME: SAMPLING
9/1/2021 Leader: Modeling Laboratory/Healthcare Exposures in DOEHRS-IH (60min)	THEME: CONTROLING AIR CONTAMINANTS
9/1/2021 Leader: Laboratory/Healthcare Compliance Survey Tour (2hr)	THEME: SURVEY
9/1/2021 SME: Ergonomic Patient Handling (28min)	THEME: HAZARD EVALUATION AND CONTROL

REVIEW	*Recommended Healthcare/Laboratory lessons if you have not already viewed these previously)*
Leader	Adventures in Ventilation at Natick Laboratories (68min)
Monster	Pathology, Grossing, Morgue, Tissue, and Death Care (1.5hr)
SME	Pharmacy Hazardous Drug Samples (28min)
Leader	Audiometric Booth Testing and Certification (17min)

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

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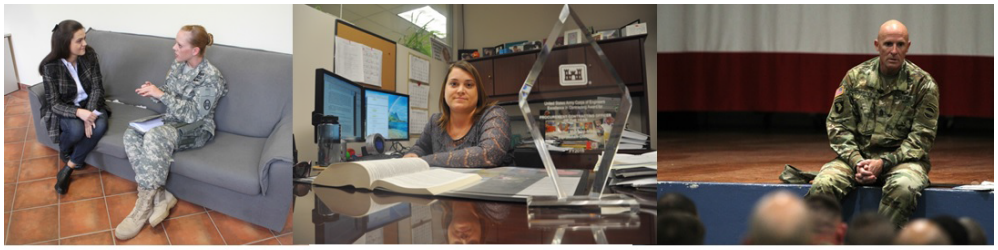
On the Web:
http://phc.amedd.army.mil/topics/workplacehealth/ih/Pages/default.aspx



Professional Development and Career Programs

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

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

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