June 2021
Issue 117

Army Industrial Hygiene News and Regulatory Summary

Hazardous Substances

Application of Text Mining in Risk Assessment of Chemical Mixtures: A Case Study of Polycyclic Aromatic Hydrocarbons (PAHs)

Special Interest Articles:

Background:
Cancer risk assessment of complex exposures, such as exposure to mixtures of polycyclic aromatic hydrocarbons (PAHs), is challenging due to the diverse biological activities of these compounds. With the help of text mining (TM), we have developed TM tools—the latest iteration of the Cancer Risk Assessment using Biomedical literature tool (CRAB3) and a Cancer Hallmarks Analytics Tool (CHAT)—that could be useful for automatic literature analyses in cancer risk assessment and research. Although CRAB3 analyses are based on carcinogenic modes of action (MOAs) and cover almost all the key characteristics of carcinogens, CHAT evaluates literature according to the hallmarks of cancer referring to the alterations in cellular behavior that characterize the cancer cell.

Objectives:
The objective was to evaluate the usefulness of these tools to support cancer risk assessment by performing a case study of 22 European Union and U.S. Environmental Protection Agency priority PAHs and diesel exhaust and a case study of PAH interactions with silica.

Read more:
https://ehp.niehs.nih.gov/doi/10.1289/EHP6702

Contents:

Investigation of Particle Transfer to Sampler Covers during the Transportation of Samples

This study investigated the effects of particle transfer to the covers of aerosol samplers during transportation of wood dust and welding fume samples. Wood dust samples were collected in a sanding chamber using four sampler types: closed-face cassettes (CFC), CFC with Accu-CAP inserts, disposable inhalable samplers (DIS), and Institute of Occupational Medicine (IOM). Welding fumes were collected in a walk-in chamber using the same samplers, with Solu-Sert replacing Accu-CAP. The samples were divided into two groups, with one group transported by air and the other by land. They were returned in the same manner and analyzed gravimetrically for wood dust and chemically for welding fumes. For wood dust, IOM showed a significantly higher percentage of particles transferred to the covers compared with the other samplers regardless of the transportation mode ($p < 0.0001$; 64% by air and 15% by land), while other samplers showed less than or close to 10% (3.5–12%). When the percentages of particle transfer to the covers were compared between the air and land transportation, both IOM and CFC samples showed differences between modes of transportation, while others did not. For welding fumes, most samples (61% of samples for copper [Cu] and 76% of samples for manganese [Mn]) showed nondetectable amounts of the analyte on the covers. For all samplers, the

particle transfer to the covers for both transportation modes ranged from 0.2–33% for Cu and less than 4.5% for Mn. Overall, this study confirms that particle transfer to sampler covers during transport highly depends upon the transportation mode and sampler type for wood dust, whereas particle transfer seems minimal for welding fumes. The findings of this study are based on two materials and limited sample sizes. Further investigation considering different industry types and tasks, particle size ranges, and materials might be necessary. Nevertheless, occupational professionals should account for this transfer when handling and analyzing samples in practice.

Read more: Journal of Occupational and Environmental Hygiene, Published online: 15 Jun 2021 (Available with AIHA membership)

Pivotal Study Links Lung Cancer Death to Diesel Exhaust

In 2012, a study of non-metal miners showed that exposure to diesel exhaust particulate, or small particles, greatly increased the risk of death from lung cancer. This study, published in the *Journal of the National Cancer Institute* external icon, was an important advance in understanding the relationship between this exposure and the risk of lung cancer death.

Prior studies had showed that diesel exhaust increased the risk of lung cancer, but few systematically measured exposures among workers, especially miners, whose jobs may place them at much greater risk. In fact, exposure to diesel exhaust among underground miners can be 100 times greater than typical environmental

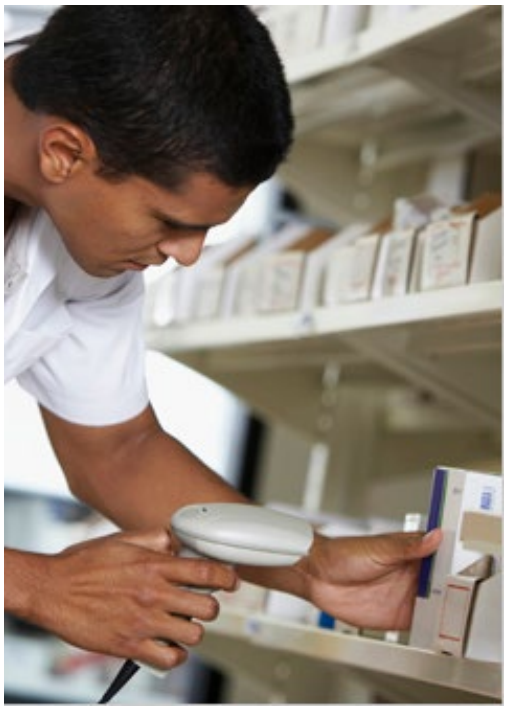
exposures and 10 times greater than other workplace exposures, according to NIOSH.

In this study, investigators used death records to look at the relationship between lung cancer death and exposure to diesel exhaust particulate among 12,315 miners at eight non-metal mining companies in the United States. They estimated each worker's cumulative exposure to small, inhalable carbon particles in diesel exhaust from the time the companies started using diesel equipment through 1997. They based

these estimates on industrial hygiene measurements taken during the study and historical measurements of exposure to carbon monoxide and other related mining equipment measurements.

Read more: https://www.cdc.gov/niosh/enews/enewsv19n2.html#then

Assessment of Occupational Exposure to Nebulized Isopropyl Alcohol as Disinfectant during Aseptic Compounding of Parenteral Cytotoxic Drugs in Cleanrooms



Pharmacy technicians are exposed to volatile organic compounds, like the disinfectant isopropyl alcohol (IPA), during the process of aseptic compounding of parenteral cytotoxic drugs. The occupational exposure to nebulized IPA during aseptic compounding has not been investigated. The aim of this study was to investigate the exposure to IPA during aseptic compounding of parenteral cytotoxic drugs and to assess compliance with legal and regulatory limits. As a secondary endpoint, the difference between two disinfection methods was compared regarding the exposure to IPA. The exposure to IPA was measured during five working shifts of 8 hr and one shift of 4 hr. The concentration IPA was measured by using a six-gas monitor. Total daily exposure was calculated as 8-hr Time Weighted Average (TWA) air concentration in mg/m^3 and compared with an Occupational Exposure Limit (OEL) value of 500 mg/m^3 and incidental peak exposure of 5,000 mg/m^3. To assess whether the 8-hr TWA air concentration meets the legal and regulatory limits the Similar Exposure Groups (SEG) compliance test was used. A paired sample t-test was conducted to assess difference in exposure between two disinfection methods. The average 8-hr TWA exposure to IPA during the six measurements varied from 2.6 mg/m^3 to 43.9 mg/m^3 and the highest momentary concentration measured was 860 mg/m^3. The result of the SEG compliance test was 3.392 (U_r value) and was greater than the U_t value of 2.187 which means the exposure to

IPA is in compliance with the OEL value. No significant difference in exposure was shown between two disinfection methods ($p = 0.49$). In conclusion, exposure to IPA during aseptic compounding of parenteral cytotoxic drugs showed compliance to the OEL values with no significant difference in exposure between two disinfection methods.

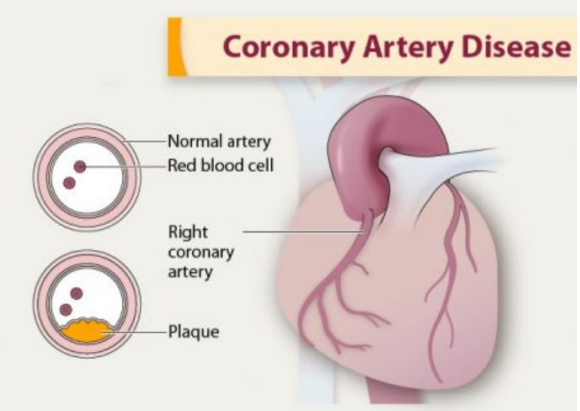
Read more: Journal of Occupational and Environmental Hygiene, Published online: 29 Jun 2021 (Available with AIHA membership)

Cadmium Exposure and Coronary Artery Atherosclerosis: A Cross-Sectional Population-Based Study of Swedish Middle-Aged Adults

Background:
The general population is ubiquitously exposed to the toxic metal cadmium through the diet and smoking. Cadmium exposure is associated with increased morbidity and mortality in myocardial infarction and stroke. Atherosclerosis is the main underlying mechanism of myocardial infarction. However, associations between cadmium and coronary artery atherosclerosis have not been examined.

Objectives:
Our study sought to examine the hypothesis that blood cadmium (B-Cd) is positively associated with coronary artery calcification, as a measure of coronary artery atherosclerosis in the population-based Swedish SCAPIS study.

Methods:
Our analysis included 5,627 individuals (51% women), age 50–64 y, enrolled from 2013 to 2018. The coronary artery calcium score (CACS) was obtained from computed tomography. Blood cadmium was



determined by inductively coupled plasma mass spectrometry (ICP-MS). Associations between B-Cd and coronary artery calcium score (CACS Agatston score) were evaluated using prevalence ratios (PRs) in models adjusted for sex, age, smoking, hypertension, diabetes, low-density cholesterol/high-density cholesterol ratio, and family history.

Read more:
https://ehp.niehs.nih.gov/doi/10.1289/EHP8523

Legionnaires' Disease in Dental Offices: Quantifying Aerosol Risks To Dental Workers and Patients

Legionella pneumophila is an opportunistic bacterial respiratory pathogen that is the leading causes of drinking water outbreaks in the United States. Dental offices pose a potential risk for inhalation or aspiration of *L. pneumophila* due to the high surface area to volume ratio of dental unit water lines—a feature that is conducive to biofilm growth. This is coupled with the use of high-pressure water devices (e.g., ultrasonic scalers) that produce fine aerosols within the breathing zone. Prior research confirms that *L. pneumophila* occurs in dental unit water lines, but the associated human health risks have not been assessed. We aimed to (1) synthesize the evidence for transmission and management of Legionnaires' disease in dental offices; (2) create a quantitative modeling framework for predicting associated *L. pneumophila* infection risk; and (3) highlight influential parameters and research gaps requiring further study. We reviewed outbreaks, management guidance, and exposure studies and used these data to parameterize a quantitative microbial risk assessment (QMRA) model for *L. pneumophila* in dental applications. Probabilities of infection for dental hygienists and patients were assessed on a per-exposure and annual basis. We also assessed the impact of varying ventilation rates and the use of personal protective equipment (PPE). Following an instrument purge (i.e., flush) and with a ventilation rate of 1.2 air changes per hour, the median per-exposure probability of infection for dental hygienists and patients exceeded a 1-in-10,000 infection risk benchmark. Per-exposure risks for workers during a purge and annual risks for workers wearing N95 masks did not exceed the benchmark. Increasing air change rates in the treatment room from 1.2 to 10 would achieve an ~85% risk reduction, while utilization of N95 respirators would reduce risks by ~95%. The concentration of *L. pneumophila* in dental unit water lines was a dominant parameter in the model and driver of risk. Future risk assessment efforts and refinement of microbiological control protocols would benefit from expanded occurrence datasets for *L. pneumophila* in dental applications.

Read more: Journal of Occupational and Environmental Hygiene, Accepted author version posted online: 23 Jun 2021 *(Available with AIHA membership)*

Researchers Identify More Worker Deaths Linked to Paint-Stripping Chemical

Worker deaths caused by exposure to methylene chloride are on the rise, according to researchers from OSHA and the University of California, San Francisco, who identified 32 deaths on top of those the Environmental Protection Agency had recently reported over a period spanning nearly four decades.

Methylene chloride is a solvent widely used in paint strippers, cleaners, adhesives and sealants. Analyzing 1980-2018 data from inspection reports, autopsy reports and medical records, as well as other resources, the researchers categorized cases either as consumer cases occurring in the home or those that happened on the job. Of the 85 deaths linked to the chemical, 87% were

considered work-related. Previously, EPA had connected 53 deaths to the solvent.

Read more: https://www.safetyandhealthmagazine.com/articles/21402-researchers-identify-more-worker-deaths-linked-to-paint-stripping-chemical

Radiation

IAEA Develops First of its Kind Emergency Preparedness and Response Guide for Medical Physicists

Radiation emergencies can occur anywhere, at any time and protecting the health and safety of the affected individuals is the first priority. How can people, including medical personnel, be assured that they are protected when there are no radiation experts on site?

Medical physicists, uniquely qualified to provide emergency support are usually not trained in emergency preparedness and

response (EPR). A recently issued IAEA publication, the Guidance for Medical Physicists Responding to a Nuclear or Radiological Emergency, provides specific details to help close that gap and enable clinically qualified medical physicists to effectively support first responders during a nuclear or radiological accident. The publication has also been condensed into an accompanying pocket guide for swift information.

Read more:
https://www.iaea.org/newscenter/news/iaea-develops-first-of-its-kind-emergency-preparedness-and-response-guide-for-medical-physicists

Ventilation

Cost and Air Quality Benefits of Enhanced Ventilation Systems

Among the lessons learned during the pandemic is this big one: We no longer can look at building ventilation systems from just a pure comfort standpoint. Comfort has been replaced by health and safety as top priorities.

Of course, many of us who design, build, install and operate building ventilation equipment have long been concerned with proper filtration to achieve air quality. However, recommendations for appropriate levels of filtration may not have been fully implemented. And the new risks associated with COVID-19 compel us to change our priorities. For many property owners, there's urgency to significantly improve air quality within buildings — especially as businesses, schools and other organizations seek to fully reopen their facilities.

Read more:
https://www.contractingbusiness.com/iaq-ventilation/article/21165824/cost-and-air-quality-benefits-of-enhanced-ventilation-systems

PPE

Comparison of ISO Work of Breathing and NIOSH Breathing Resistance Measurements for Air-Purifying Respirators

The National Institute for Occupational Safety and Health's methods and requirements for air-purifying respirator breathing resistance in 42 CFR Part 84 do not include work of breathing. The International Organization for Standardization Technical Committee 94, Subcommittee 15 utilized work of breathing to evaluate airflow resistance for all classes of respiratory protective devices as part of their development of performance standards regarding respiratory protective devices. The objectives of this study were: (1) to evaluate the relationship between the International Organization for Standardization's work of breathing measurements and the National Institute for Occupational Safety and Health's breathing resistance test results; (2) to provide scientific bases for standard development organizations to decide if work of breathing should be adopted; and (3) to establish regression equations for manufacturers and test laboratories to estimate work of breathing measurements using breathing resistance data. A total of 43 respirators were tested for work of breathing at minute ventilation rates of 10, 35, 65, 105, and 135 liters per minute. Breathing resistance obtained at a constant flow rate of 85 liters per minute per National Institute of Occupational Safety and Health protocol was correlated to each of the parameters (total work of breathing, inhalation, and exhalation) obtained from the work of breathing tests. The ratio of work of breathing exhalation to work of breathing inhalation for all air-purifying respirators is similar to the ratio of exhalation to inhalation resistance when tested individually. The ratios were about 0.8 for filtering facepiece respirators, 0.5 for half-masks, and 0.25 for full-facepiece respirators. The National Institute for Occupational Safety and Health's breathing resistance is close to work of breathing's minute ventilation of 35 liters per minute, which represents the common walking/working pace in most workplaces. The work of breathing and the National Institute of Occupational Safety and Health's breathing resistance were found to be strongly and positively correlated (r values of 0.7–0.9) at each work rate for

inhalation and exhalation. In addition, linear and multiple regression models (R-squared values of 0.5–0.8) were also established to estimate work of breathing using breathing resistance. Work of breathing was correlated higher to breathing resistance for full-facepiece and half-mask elastomeric respirators than filtering facepiece respirators for inhalation. For exhalation, filtering facepiece respirators were correlated much better than full-facepiece and half-mask elastomeric respirators. Therefore, the National Institute for Occupational Safety and Health's breathing resistance may reasonably be used to predict work of breathing for air-purifying respirators. The results could also be used by manufacturers for product development and evaluation.

Read more: Journal of Occupational and Environmental Hygiene, Published online: 25 Jun 2021 (Available with AIHA membership)

Noise

Effect of Noise and Ototoxicants on Developing Standard Threshold Shifts at a U.S. Air Force Depot Level Maintenance Facility

Noise exposure has traditionally been considered the primary risk factor for hearing loss. However, ototoxicants commonly found in occupational settings could affect hearing loss independently, additively, or synergistically when combined with noise exposures. The purpose of this investigation was to determine the combined effect of metal and solvent ototoxicants, continuous noise, and impulse noise on hearing loss. Noise and ototoxicant exposure and pure-tone audiometry results were analyzed for U.S. Air Force personnel (n = 2,372) at a depot-level aircraft maintenance activity at Tinker Air Force Base, Oklahoma. Eight similar exposure groups based on combinations of ototoxicant and noise exposure were created including: (1) Continuous noise (reference group); (2) Continuous

noise + Impulse noise; (3) Metal exposures + Continuous noise; (4) Metal exposures + Continuous noise + Impulse noise; (5) Solvent exposure + Continuous noise; (6) Solvent exposures + Continuous noise + Impulse noise; (7) Metal exposure + Solvent exposures + Continuous noise; and (8) Metal exposure + Solvent exposures + Continuous noise + Impulse noise. Hearing loss was assessed at center

octave band frequencies of 500–6,000 Hz and using National Institute for Occupational Safety and Health Standard Threshold Shift (STS) criteria. Hearing changes were significantly worse at 2,000 Hz in the Metal exposure + Solvent exposure + Continuous noise group compared to the Continuous noise only reference group (p = 0.023). The Metal exposure + Solvent exposure + Continuous noise group had a significantly greater relative risk (RR) of 2.44; 95% CI [1.24, 4.83] for developing an STS at 2,000 Hz. While not statistically significant, the Solvent exposure + Continuous noise group had a RR of 2.32; 95%CI [1.00, 5.34] for developing an STS at 1,000 Hz. These results indicate that noise exposure may dominate hearing loss at ≥3,000 Hz while combined effects of concomitant exposure to ototoxic substances and noise are only noticeable at ≤2,000 Hz. These results also suggest combined exposures to ototoxicants and noise presents a greater hearing loss risk than just noise.

Read more: Journal of Occupational and Environmental Hygiene, Published online: 08 Jun 2021(Available with AIHA membership)

Preventive Medicine

Hospitals Start Requiring Workers to Get COVID Shots

After a Texas federal court sided with a Houston hospital that required workers to get a COVID-19 vaccine or find another job, public health experts predict that most hospitals and medical practices will soon issue similar mandates.

When vaccines first became available in December under an emergency use authorization, hospitals reported that they planned to wait until the U.S. Food and Drug Administration granted full approval of the vaccines before deciding whether to make the shots mandatory.

Read more:
https://www.pewtrusts.org/en/research-and-analysis/blogs/stateline/2021/06/21/hospitals-start-requiring-workers-to-get-covid-shots

Night Shift Workers and Cancer Risk: Researchers Find New Clues

Night shift schedules "throw off the timing of expression of cancer-related genes in a way that reduces the effectiveness of the body's DNA repair processes when they are most needed," results of a recent study led by researchers from Washington State University show.

Jason McDermott, a computational scientist with the Pacific Northwest National Laboratory's Biological Sciences Division, and others conducted a simulated shift work experiment involving 14 young adults. Half of the participants followed a night shift schedule for three days, while the other half completed a day shift schedule. into work may lead to a fatal end as well.

Read more:
https://www.safetyandhealthmagazine.com/articles/21343-night-shift-workers-and-cancer-risk-researchers-find-new-clues

High Caffeine Consumption may be Associated with Increased Risk of Blinding Eye Disease

Consuming large amounts of daily caffeine may increase the risk of glaucoma more than three-fold for those with a genetic predisposition to higher eye pressure according to an international, multi-center study. The research led by the Icahn School of Medicine at Mount Sinai is the first to demonstrate a dietary - genetic interaction in glaucoma. The study results published in the June print issue of *Ophthalmology* may suggest patients with a strong family history of glaucoma should cut down on caffeine intake.

Read more:
https://www.mountsinai.org/about/newsroom/2021/high-caffeine-consumption-may-be-associated-with-increased-risk-of-blinding-eye-disease

Resistant Bacteria in Veterinary Workers Linked to Contact with Animals

Nearly 1 in 10 veterinary workers in the Netherlands carries a multidrug-resistant strain of intestinal bacteria, almost twice the prevalence of the general population, Dutch researchers reported in a study being presented at the European Congress of Clinical Microbiology and Infectious Diseases (ECCMID).

To get a better understanding of the extent of transmission of intestinal bacteria carrying extended-spectrum beta-lactamase (ESBL) and AmpC genes between humans and animals, researchers from the National Institute for Public Health and the Environment collected stool samples from

482 veterinary workers and conducted whole-genome sequencing to identify the species of bacteria and detect the presence of ESBL/AmpC.

Read more:
https://www.cidrap.umn.edu/news-perspective/2021/06/asp-scan-weekly-jun-25-2021 (scroll down to the 3rd heading)

Global Travelers Acquire Destination-Specific Resistance Genes

New research published today in *Genome Medicine* provides further evidence that international travelers can pick up dangerous drug-resistant bacteria during their journeys and bring it home with them. The study by US and Dutch scientists analyzed DNA from fecal samples of 190 Dutch travelers before and after they traveled to destinations in South Asia, Southeastern Asia, Northern Africa, and Eastern Africa and found that they brought back 56 unique antimicrobial resistance (AMR) genes, including several of high clinical concern. They also found that the genes acquired—and the changes that occurred in the gut microbiomes of the travelers—were destination specific.

Read more:
https://www.cidrap.umn.edu/news-perspective/2021/06/global-travelers-acquire-destination-specific-resistance-genes

Environmental Health

Soaring E-Waste Affects the Health of Millions of Children, WHO Warns

Effective and binding action is urgently required to protect the millions of children, adolescents and expectant mothers worldwide whose health is jeopardized by the informal processing of discarded electrical or electronic devices according to a new ground-breaking report from the World Health Organization: *Children and Digital Dumpsites.*

Read more: https://www.who.int/news/item/15-06-2021-soaring-e-waste-affects-the-health-of-millions-of-children-who-warns

In Utero Exposure to Heavy Metals and Trace Elements and Childhood Blood Pressure in a U.S. Urban, Low-Income, Minority Birth Cohort

Background:
In utero exposure to heavy metals lead (Pb), mercury (Hg), and cadmium (Cd) may be associated with higher childhood blood pressure (BP), whereas trace elements selenium (Se) and manganese (Mn) may have protective antioxidant effects that modify metal-BP associations.

Objectives:
We examined the individual and joint effects of *in utero* exposure to Pb, Hg, Cd, Se, and Mn on childhood BP.

Methods:
We used data from the Boston Birth Cohort (enrolled 2002–2013). We measured heavy metals and trace elements in maternal red blood cells collected 24–72 h after delivery. We calculated child BP percentile per the 2017 American Academy of Pediatrics Clinical Practice Guideline. We used linear regression models to estimate the association of each metal, and Bayesian kernel machine regression (BKMR) to

examine metal coexposures, with child BP between 3 to 15 years of age.

Read more:
https://ehp.niehs.nih.gov/doi/10.1289/EHP8325

Geospatial Data, Population Health Merge at NIEHS Workshop

Geospatial technology has become an integral part of our everyday lives. It helps us map our route, warns us when the air quality in our area is unhealthy, and even tracks our location when we are playing on our smart phones. But scientists believe that geographic information systems can do much more, particularly when expanded from the personal to the population level.

Read more:
https://factor.niehs.nih.gov/2021/7/feature/1-feature-geospatial-data/index.htm

New Approach Sheds Light on PFAS in Coastal Watersheds

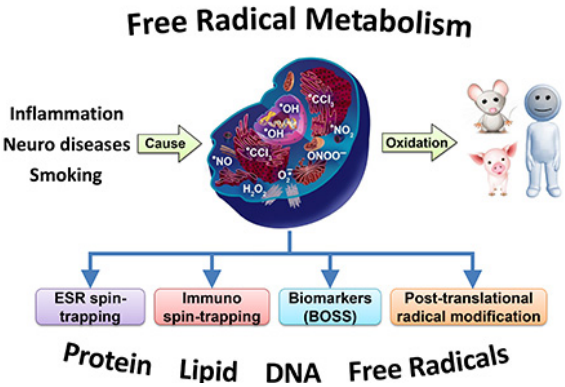
NIEHS-funded researchers developed a new tool to identify and characterize previously undetected per- and polyfluoroalkyl substances (PFAS) in watersheds on Cape Cod, Massachusetts. The team identified a distinct signature for PFAS from aqueous film forming foam (AFFF), which is used in firefighting and can contaminate drinking water. However, a large fraction of fluorine could not be explained by AFFF.

PFAS are a large group of compounds that have a carbon-fluorine backbone but vary in other chemical characteristics, such as carbon chain length. In the environment, some PFAS change and transform, making it difficult to identify the parent compound and its source.

Read more:
https://factor.niehs.nih.gov/2021/6/papers/dert/index.htm

Exposure to Pollutants, Increased Free-Radical Damage Speeds Up Aging

Every day, our bodies face a bombardment of UV rays, ozone, cigarette smoke, industrial chemicals and other hazards. This exposure can lead to free-radical production in our bodies, which damages our DNA and tissues. A new study from West Virginia University researcher Eric E. Kelley -- in collaboration with the University of Minnesota -- suggests that unrepaired DNA damage can increase the speed of aging. The study appears in the journal *Nature*.



Read more:
https://www.sciencedaily.com/releases/2021/06/210621160520.htm

Ergonomics

Safety Shields Leading to Shoulder Injuries among Bus Drivers: Hazard Alert

Bus drivers who repeatedly open and close manually operated safety shields used as a COVID-19 prevention measure are experiencing symptoms of shoulder injuries, according to a new safety alert from the Washington State Department of Labor & Industries.

The alert states that drivers from several state transit agencies are having to reach out to their sides and behind their bodies while using force to move the shields. These repeated awkward movements and overreaching can put the shoulder joint at the end of its range of motion and cause damage over time. The rotator cuff can be especially prone to injury from these repeated movements.

Read more:
https://www.safetyandhealthmagazine.com/articles/21344-safety-shields-leading-to-

shoulder-injuries-among-bus-drivers-hazard-alert

Safety

Increased Use of Household Fireworks Creates a Public Health Hazard

Fireworks are synonymous in the United States with the celebration of Independence Day and other special events, but the colorful displays have caused a growing risk to public safety in recent years, according to a study by environmental health researchers at the University of California, Irvine.

Relying on real-time air quality measurements crowdsourced from a network of more than 750 automated sensors distributed throughout California, scientists from UCI's Program in Public Health found that short-term, extremely high-particulate-matter air pollution from the widespread use of fireworks spiked during the periods of late June through early July in 2019 and 2020.

Read more:
https://www.sciencedaily.com/releases/2021/06/210629144331.htm

Smart Wound Dressings with Built-in Healing Sensors

Researchers have developed smart wound dressings with built-in nanosensors that glow to alert patients when a wound is not healing properly.

The multifunctional, antimicrobial dressings feature fluorescent sensors that glow brightly under UV light if infection starts to set in and can be used to monitor healing progress.

The smart dressings, developed by a team of scientists and engineers at RMIT University harness the powerful antibacterial and antifungal properties of magnesium hydroxide.
They are cheaper to produce than silver-based dressings but equally as effective in fighting bacteria and fungi, with their antimicrobial power lasting up to a week.

Read more: https://phys.org/news/2021-06-smart-wound-built-in-sensors.html

Forget Wearables: Future Washable Smart Clothes Powered By Wi-Fi Will Monitor Your Health

Purdue University engineers have developed a method to transform existing cloth items into battery-free wearables resistant to laundry. These smart clothes are powered wirelessly through a flexible, silk-based coil sewn on the textile.
In the near future, all your clothes will become smart. These smart clothes will outperform conventional passive garments, thanks to their miniaturized electronic circuits and sensors, which will allow you to seamlessly communicate with your phone, computer, car and other machines. This smart clothing will not only make you more productive but also check on your health status and even call for help if you suffer an accident. The reason why this smart clothing is not all over your closet yet is that the fabrication of this smart clothing is quite challenging, as clothes need to be

periodically washed and electronics despise water.

Read more: https://phys.org/news/2021-06-wearables-future-washable-smart-powered.html

Vapors from Isopropyl Alcohol Can Irritate, Ignite: Hazard Alert

Vapors from isopropyl alcohol solutions and disinfecting wipes can irritate workers' eyes, nose and throat; cause dizziness and headaches; and build up in the air and easily ignite, warns a new hazard alert from the Washington State Department of Labor & Industries.

Employers with workers who use solutions or wipes with IPA, also known as rubbing alcohol, to clean and disinfect surfaces must ensure the facility has proper ventilation.

Read more: https://www.safetyandhealthmagazine.com/articles/21425-vapors-from-isopropyl-alcohol-can-irritate-ignite-hazard-alert

Study Reveals Agriculture-Related Injuries More Numerous than Previously Known

A new study by Penn State researchers, who looked at emergency room admissions across the U.S. over a recent five-year period in a novel way, suggests that the agriculture industry is even more dangerous than previously believed.

The research revealed that from Jan. 1, 2015, to Dec. 31, 2019, more than 60,000 people were treated in emergency departments for nonfatal, agricultural-related injuries. Significantly, nearly a third of those injured were youths, according to study author Judd Michael, Nationwide Insurance Professor of Agricultural Safety and Health and professor of agricultural and biological engineering, College of Agricultural Sciences.

Read more: https://www.sciencedaily.com/releases/2021/06/210623113910.htm

Western High-Fat Diet Can Cause Chronic Pain, According To New Study

A typical Western high-fat diet can increase the risk of painful disorders common in people with conditions such as diabetes or obesity, according to a groundbreaking paper authored by a team led by The University of Texas Health Science Center at San Antonio, also referred to as UT Health San Antonio.

Moreover, changes in diet may significantly reduce or even reverse pain from conditions causing either inflammatory pain -- such as arthritis, trauma or surgery -- or neuropathic pain, such as diabetes. The novel finding could help treat chronic-pain patients by simply altering diet or developing drugs that block release of certain fatty acids in the body.

Read more:
https://www.sciencedaily.com/releases/2021/06/210623141644.htm

Emergency Preparedness

NIH Disaster Research Response Program Launches New Website

For more than 20 years, the National Institute of Environmental Health Sciences (NIEHS) has played a lead role in our nation's health research following oil spills, hurricanes, and other environmental calamities. Now, the institute is providing a new home for the Disaster Research Response (DR2) program and its vast collection of web-based resources needed for scientists to conduct vital and timely public health research in the aftermath of disasters.

More than 500 curated research tools and resources are now organized into an easy-to-use online portal, available on the NIEHS website free of charge.

Read more:
https://factor.niehs.nih.gov/2021/6/feature/2-feature-disaster-response/index.htm

Deployment Health

Defense Secretary Supports Major Change in Prosecuting Sexual Assault: Taking Cases Out of Commanders' Hands

Defense Secretary Lloyd Austin said on Tuesday he supported taking the decision to prosecute sexual assault cases out of commanders' hands, marking a major shift toward a change that military leaders have long opposed.

Austin said in a statement that the Pentagon would work with Congress "to amend the Uniform Code of Military Justice, removing the prosecution of sexual assaults and related crimes" from the chain of command. The changes were recommended by the Independent Review Commission on Sexual Assault and Sexual Harassment.

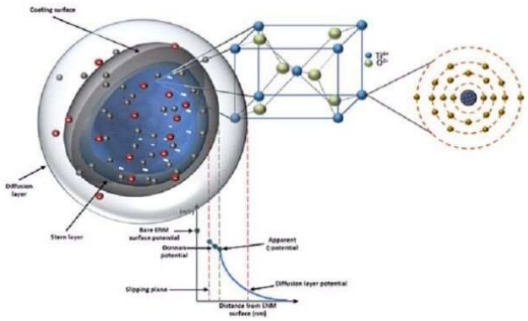
Read more:
https://taskandpurpose.com/news/lloyd-austin-supports-sexual-assault-prosecution-change/

Nanotechnology

Online 'Library of Properties' Helps to Create Safer Nanomaterials

Researchers have developed a 'library of properties' to help identify the environmental impact of nanomaterials faster and more cost effectively.

Whilst nanomaterials have benefited a wide range of industries and revolutionized everyday life, there are concerns over potential adverse effects—including toxic effects following accumulation in different



organs and indirect effects from transport of co-pollutants.

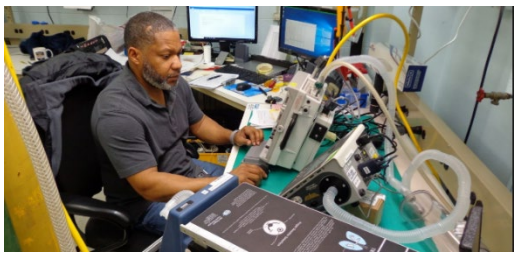
The European Union H2020-funded NanoSolveIT project is developing a ground-breaking computer-based Integrated Approach to Testing and Assessment (IATA) for the environmental health and safety of nanomaterials.

Read more: https://phys.org/news/2021-06-online-library-properties-safer-nanomaterials.html

Regulatory Research & Industrial Hygiene Professional News

FDA

FDA in Brief: FDA Issues Draft Guidance on Remanufacturing and Discussion Paper Seeking Feedback on Cybersecurity Servicing of Medical Devices



"Many medical devices are reusable and need preventative maintenance and repair during their useful life; therefore, proper servicing is critical to their continued safe and effective use. With this in mind, the FDA is issuing today's draft guidance to help clarify whether activities performed on medical devices are likely remanufacturing as well as a discussion paper on cybersecurity servicing of devices. It is important for industry personnel, such as original equipment manufacturers, servicers and remanufacturers, to have a clear understanding of activities that are considered remanufacturing so that they can apply appropriate statutory and regulatory requirements which exist to keep the American public safe."

Read more: https://www.fda.gov/news-events/press-announcements/fda-brief-fda-issues-draft-guidance-remanufacturing-and-discussion-paper-seeking-feedback

CDC

CDC Can't Regulate Cruises: Judge

A federal judge in Florida on Friday ruled that the Centers for Disease Control and Prevention's (CDC) coronavirus-era sailing orders were an overreach of power, issuing a preliminary injunction temporarily barring the CDC from enforcing the guidelines. Judge Steven Merryday for the Middle District of Florida in his ruling sided with the Sunshine State in its argument that the "CDC's conditional sailing order and the implementing orders exceed the authority delegated to CDC."

Read more:
https://thehill.com/policy/transportation/559248-cdc-cant-regulate-cruises-judge

NIOSH

NIOSH Issues Nonregulatory Mask Criteria

The National Institute for Occupational Safety and Health (NIOSH) released new criteria for masks to help protect workers from the SARS-CoV-2 virus, which causes COVID-19. The NIOSH criteria incorporate the nonregulatory American Society for Testing and Materials (ASTM) Specification for Barrier Face Coverings (F3502-21).

Read more:
https://ehsdailyadvisor.blr.com/2021/06/niosh-issues-nonregulatory-mask-criteria/

OSHA

OSHA Publishes Inspection and Enforcement Directive on COVID-19 ETS

U.S. DEPARTMENT OF LABOR OSHA DIRECTION Occupational Safety and Health Administration

OSHA has issued a directive on inspection procedures and enforcement policies for its COVID-19 emergency temporary standard covering health care workers.
The ETS applies to "settings where any employees provide health care or health care support services," such as hospitals, nursing homes and assisted living facilities. Some exceptions apply, however, including "non-hospital ambulatory care settings" where non-employees are screened for COVID-19 before entering and individuals suspected of having or confirmed to have COVID-19 are not allowed to enter.

Read more:
https://www.safetyandhealthmagazine.com/articles/21431-osha-publishes-inspection-and-enforcement-directive-on-covid-19-ets

OSHA Standard Changes that Will Impact Construction

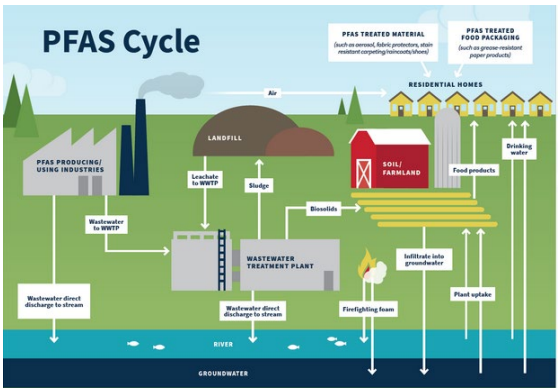
The U.S. Department of Labor's (DOL) regulatory agenda for spring 2021 lists regulations the agency will focus on for the next six months, including 26 Occupational Safety and Health Administration (OSHA) regulations, six of which are in the final rule stage and the rest are in the proposed or pre-rule stage. Many of them will directly affect the construction industry.

Heat Illness Prevention
Perhaps the most consequential for the construction industry will be the standard for Heat Illness Prevention in Outdoor and Indoor Work Settings.

Read more:
https://www.natlawreview.com/article/osha-standard-changes-will-impact-construction

EPA

New EPA PFAS Announcements Carry Significance



Yesterday, the Environmental Protection Agency (EPA) took three new actions related to PFAS, each of them significant to companies in the United States. The new EPA PFAS announcements included:

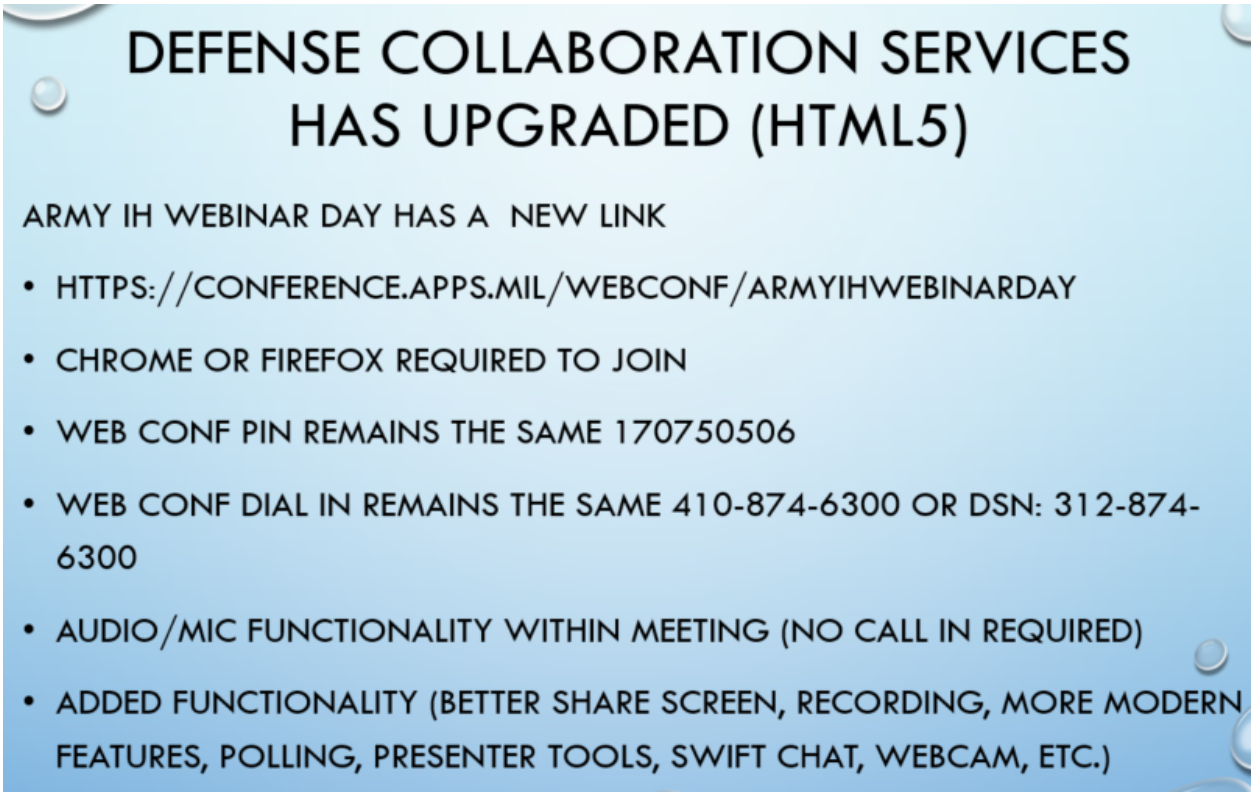
1. issuing a proposed rule that will gather comprehensive data on more than 1,000 PFAS compounds that are manufactured or imported into the United States;
2. withdrawing guidance that weakened EPA's July 2020 Significant New Use Rule (SNUR) restricting certain long-chain PFAS; and
3. publishing a final rule that officially incorporates three additional PFAS into the Toxics Release Inventory (TRI).

The details of each are provided below; however, for any company that manufactures, imports, or utilizes PFAS in manufacturing, it is critical to pay attention to these developments.

Read more:
https://www.natlawreview.com/article/new-epa-pfas-announcements-carry-significance

APHC

Training



2021 QUARTERLY ARMY IH WEBINAR DAY

HTTPS://CONFERENCE.APPS.MIL/WEBCONF/ARMYIHWEBINARDAY

12/2/2020	Monster	Building Downdraft Tables in DOEHRS-IH	Steven
12/2/2020	Leader	Measuring Downdraft Ventilation	Belden
12/2/2020	SME	Downdraft Ventilation Q/A	Belden
12/2/2020	SME	DOEHRS-IH Report Standardization	Delk
12/2/2020	Leader	Compressed Air use with Heavy Metals	Hueth
3/3/2021	**Leader**	**Vehicle Maintenance Shop Design Reviews**	**Parks**
3/3/2021	**Monster**	**Building Vehicle Exhaust in DOEHRS-IH**	**Steven**
3/3/2021	**Leader**	**Measuring Vehicle Exhaust**	**Parks**
3/3/2021	**SME**	**Vehicle Exhaust Q/A**	**Parks**
3/3/2021	**SME**	**Vehicle Exhaust Ototoxins Q/A**	**Merkley**
6/2/2021	Monster	Building Drive-in/Drive-through Paint Booths in DOEHRS-IH	Steven
6/2/2021	Leader	Measuring Drive-in/Drive-through Paint Booths	Belden
6/2/2021	SME	Drive-in/Drive-through Paint Booth Q/A	Belden
6/2/2021	SME	Letterkenny Paint booth incident/accident	Wisniewski
9/1/2021	**Monster**	**Building Dilution Ventilation in DOEHRS-IH**	**Steven**
9/1/2021	**Leader**	**Measuring Dilution Ventilation**	**Parks**
9/1/2021	**SME**	**Dilution Ventilation Q/A**	**Parks**
9/1/2021	**SME**	**Sampling Qualifiers**	**Secrest**

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

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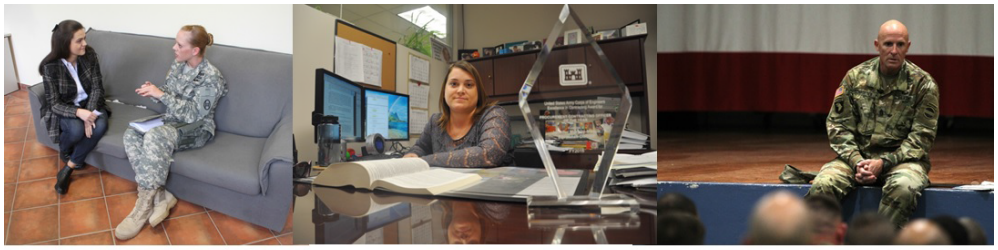

Professional Development and Career Programs

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.