May 2023
Issue 140

Army Industrial Hygiene News and Regulatory Summary

Hazardous Substances

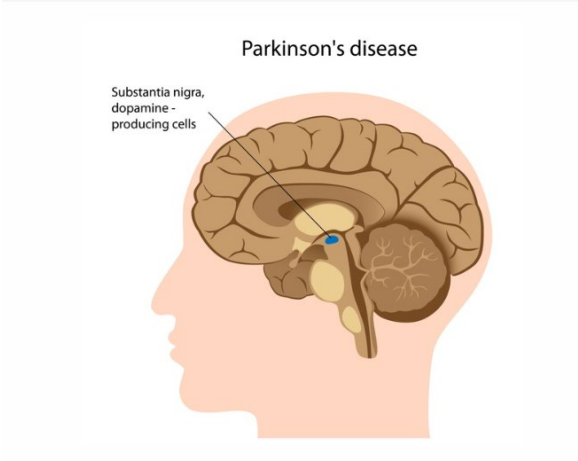
Researchers Identify 10 Pesticides Toxic to Neurons Involved in Parkinson's

Special Interest Articles:

Researchers at UCLA Health and Harvard have identified 10 pesticides that significantly damaged neurons implicated in the development of Parkinson's disease, providing new clues about environmental toxins' role in the disease.

While environmental factors such as pesticide exposure have long been linked to Parkinson's, it has been harder to pinpoint which pesticides may raise risk for the neurodegenerative disorder. Just in California, the nation's largest agricultural producer and exporter, there are nearly 14,000 pesticide products with over 1,000 active ingredients registered for use.

Through a novel pairing of epidemiology and toxicity screening that leveraged California's extensive pesticide use database, UCLA and Harvard researchers were able to identify 10 pesticides that



were directly toxic to dopaminergic neurons. The neurons play a key role in voluntary movement, and the death of these neurons is a hallmark of Parkinson's.

Read more:
https://medicalxpress.com/news/2023-05-pesticides-toxic-neurons-involved-parkinson.html

Contents:

Eye and Airway Symptoms in Hospital Staff Exposed to a Product Containing Hydrogen Peroxide, Peracetic Acid, and Acetic Acid

Background
Sporicidal products containing hydrogen peroxide (HP), peracetic acid (PAA), and acetic acid (AA) are used widely in multiple industries, including healthcare. Despite widespread use in healthcare, few studies have assessed associations between exposures to HP, PAA, and AA, and work-related symptoms in these settings.

Methods
In 2018, we performed a health and exposure assessment at a hospital where a sporicidal product consisting of HP, PAA, and AA, was used as the primary cleaner on hospital surfaces. We collected 56 personal and mobile air samples for HP, PAA, and AA on participants while they

performed their regular cleaning duties; collected area samples for HP (n = 28), PAA (n = 28), and AA (n = 70) in multiple hospital locations where cleaning was performed; and administered a postshift survey to assess eye, skin, and upper and lower airway symptoms that occurred cross-shift or in the previous 4 weeks.

Read more:
https://onlinelibrary.wiley.com/doi/full/10.1002/ajim.23488

Assessment of Indoor Bioaerosol Exposure Using Direct-Reading Versus Traditional Methods – Potential Application to Home Health Care

Home healthcare workers (HHCWs) can be occupationally exposed to bioaerosols in their clients' homes. However, choosing the appropriate method to measure bioaerosol exposures remains a challenge. Therefore, a systematic comparison of existing measurement approaches is essential. Bioaerosol measurements with a real-time, fluorescence-based Wideband Integrated Bioaerosol Sensor (WIBS) were compared to measurements with four traditional off-line methods (TOLMs). The TOLMS included optical microscopic counting of spore trap samples, microbial cultivation of impactor samples, qPCR, and next-generation sequencing (NGS) of filter samples. Measurements were conducted in an occupied apartment simulating the environments that HHCWs could encounter in their patients' homes. Descriptive statistics and Spearman's correlation test were computed to compare the real-time measurement to each TOLM. The results showed that the geometric mean number concentrations of the total fluorescent aerosol particles (TFAPs) detected with the WIBS were several orders of magnitude higher than those of total fungi or bacteria measured with the TOLMs. Among the TOLMs, concentrations obtained with qPCR and NGS were the closest to the WIBS detections. Correlations between the results obtained with the WIBS and TOLMs were not consistent. No correlation was found between the concentrations of fungi detected using microscopic counting and any of the WIBS fluorescent aerosol particle (FAP) types, either indoors or outdoors. In contrast, total concentrations detected with microbial cultivation correlated with the WIBS TFAP results, both indoors and outdoors. Outdoors, total concentration of culturable bacteria correlated with FAP type AC. In addition, fungal and bacterial concentrations obtained with qPCR correlated with FAP types AB and AC. For a continuous, high time resolution but broad scope, the real-time WIBS could be considered, whereas a TOLM would be the best choice for specific and more accurate microbial characterization. HHCWs' activities tend to re-aerosolize bioaerosols causing wide temporal variation in bioparticle concentrations. Thus, the advantage of using the real-time instrument is to capture those variations. This study lays a foundation for future exposure assessment studies targeting HHCWs.

Read more: Journal of Occupational and Environmental Hygiene, Published online: 10 May 2023 (Available with an AIHA membership

How Global Flows of Toxic Mercury Impact Human Health

Almost half of mercury exposure comes from mercury embedded in global trade, according to an analysis of the global flows of the toxic metal. Mercury is a neurotoxin that harms human health in even very small doses.

Zhencheng Xing, Ruirong Chang, and their colleagues traced the element through international trade routes from sites of pollution to exposure in the environment, and accounted for the resulting human health impacts. The authors linked a mercury emission inventory, a global multi-regional input-output model, a coupled atmosphere-land-ocean-ecosystem model, and an exposure-risk-valuation model to investigate the global biogeochemical mercury cycle.

The world emits about 1,800 megagrams of mercury annually. Most of these global emissions are linked to the smelting and pressing of non-ferrous metals, particularly during artisanal and small-scale gold mining.

Read more: https://phys.org/news/2023-05-global-toxic-mercury-impact-human.html

Confined Space Hazards: Plain Seawater, An Insidious Source of Hydrogen Sulfide

In 2022, a confined space entry accident occurred on a Danish product tanker in which two technicians died from hydrogen sulfide poisoning during the inspection of an empty cargo tank that had contained vegetable cooking oil. The source of the hydrogen sulfide was enigmatic. About three weeks before the accident, the cargo tank was prewashed with seawater. The wash water did not seem likely to present a toxic hazard and was left in the tank. However, the seawater's natural content of dissolved sulfate was converted to sulfide by sulfate-reducing bacteria, and the low-

sulfur vegetable oil residue provided the nutrients necessary for bacterial growth. Calculations confirm that sulfate in just 10 m3 of plain seawater is sufficient to create an immediately fatal concentration of H2S gas in the 4,500 m3 cargo tank of the product tanker. Accident statistics show that fatal accidents within enclosed spaces are a serious and stubborn problem and strict adherence to routine forced ventilation and extensive gas testing of cargo tanks before entry would offer simple and effective preventive measures.

Read more: Journal of Occupational and Environmental Hygiene, Published online: 09 May 2023 (Available with an AIHA membership

Improved Cookstoves Emit More Ultrafine Particles than Conventional Stoves, Finds New Study

Improved cookstoves, which are widely used for cooking in developing countries, produce twice as many harmful ultrafine air pollution particles (PM0.1) as conventional stoves, according to a new study from the University of Surrey.
Researchers from Surrey's Global Center for Clean Air Research (GCARE) found that while improved cookstoves can reduce fine particles (PM2.5) by up to 65%, they can actually increase the emission of ultrafine particles.

The GCARE team also found that ultrafine particles' large surface areas allow them to absorb a significant amount of hazardous metals and chemicals, such as arsenic, lead,

nitrate, sulfate and polycyclic aromatic hydrocarbons.

Read more:
https://phys.org/news/2023-05-cookstoves-emit-ultrafine-particles-conventional.html

Widely Used Chemical Strongly Linked to Parkinson's Disease

A groundbreaking epidemiological study has produced the most compelling evidence yet that exposure to the chemical solvent trichloroethylene (TCE)—common in soil and groundwater—increases the risk of developing Parkinson's disease. The movement disorder afflicts about 1 million Americans, and is likely the fastest growing neurodegenerative disease in the world; its global prevalence has doubled in the past 25 years.

The report, published today in JAMA Neurology, involved examining the medical records of tens of thousands of Marine Corps and Navy veterans who trained at Marine Corps Base Camp Lejeune in North Carolina from 1975 to 1985. Those exposed there to water heavily contaminated with TCE had a 70% higher risk of developing Parkinson's disease decades later compared with similar veterans who trained elsewhere. The Camp Lejeune contingent also had higher rates of symptoms such as erectile dysfunction and loss of smell that are early harbingers of Parkinson's, which causes tremors; problems with moving, speaking, and balance; and in many cases dementia. Swallowing difficulties often lead to death from pneumonia.

Read more:
https://www.science.org/content/article/widely-used-chemical-strongly-linked-parkinson-s-disease

Radiation

First-In-Human Trial of Oral Drug to Remove Radioactive Contamination Begins

A first-in-human clinical trial of an experimental oral drug for removing radioactive contaminants from inside the body has begun. The trial is testing the safety, tolerability and processing in the body of escalating doses of the investigational drug product HOPO 14-1 in healthy adults. The National Institute of Allergy and Infectious Diseases (NIAID), part of the National Institutes of Health, is

funding the Phase 1 trial, which is sponsored and conducted by SRI International of Menlo Park, California.

Internal radioactive contamination occurs when radioactive elements are absorbed through wounded skin, inhaled or ingested. This could happen as the result of a nuclear power plant accident or the detonation of a "dirty bomb(link is external)" or nuclear weapon. As the atoms of radioactive elements decay, they emit ionizing radiation, which can damage DNA, tissues and organs. One method for reducing the risk of this damage is to remove the radioactive elements from the body as soon as possible after contamination occurs.

The Food and Drug Administration has approved two products for removing

internal radioactive contamination. These drugs, both based on diethylenetriamine pentaacetate (DTPA), are administered intravenously by a healthcare provider and can remove three radioactive elements: plutonium, americium, and curium.

Read more: https://www.nih.gov/news-events/news-releases/first-human-trial-oral-drug-remove-radioactive-contamination-begins

Ultraviolet Radiation Exposure in Cannabis Growing Facilities

Cultivation and processing of cannabis is becoming an important industry in the United States and Canada. The industry employs over 400,000 workers in the United States (U.S.) and is growing rapidly. Both natural sunlight and artificial lamp-generated radiation are commonly used to grow cannabis plants. These optical sources can contain both visible and ultraviolet radiation (UVR) wavelengths, and overexposure to UVR is associated with negative health effects. The severity of these adverse health effects is governed by the specific wavelengths and exposed dose of UVR, yet worker exposure to UVR within cannabis growing facilities has not been studied. In this study, worker exposure to UVR was assessed at five cannabis production facilities in Washington State, including indoor, outdoor, and shade house facilities. Lamp emission testing was performed at each facility and worker UVR exposures were measured for 87 work-shifts. Observations of worker activities and

use of personal protective equipment in association with UVR exposure measurements were recorded. For lamp emission measurements, at three feet from the center of the lamp, the average irradiances were 4.09x10−4, 6.95x10−8, 6.76x10−9, 3.96x10−9, 1.98x10−9 effective W/cm2 for germicidal lamps, metal halide lamps, high pressure sodium lamps, fluorescent lamps, and light emitting diodes, respectively. The average measured UVR exposure was 2.91x10−3 effective J/cm2 (range: 1.54x10−6, 1.57x10−2 effective J/cm2). Thirty percent of the work-shifts monitored exceeded the American Conference for Governmental Industrial Hygienists (ACGIH) threshold limit value (TLV) of 0.003 effective J/cm2. Exposures were highest for workers who spent all or part of the work-shift outdoors, and solar radiation was the primary source of worker UVR exposure for most of the work-shifts that exceeded the TLVs. Outdoor workers can reduce UVR exposures by applying sunscreen and wearing appropriate personal protective equipment. Although the artificial lighting used in the cannabis production facilities included in this study did not contribute substantially to the measured UV exposures, in many cases the lamp emissions would generate theoretical exposures at three feet from the center of the lamp that would exceed the TLV. Therefore, employers should choose low UVR emitting lamps for indoor grow operations and should use engineering controls (e.g., door-interlocks to de-energize lamps) to prevent worker exposure to UVR from germicidal lamps.

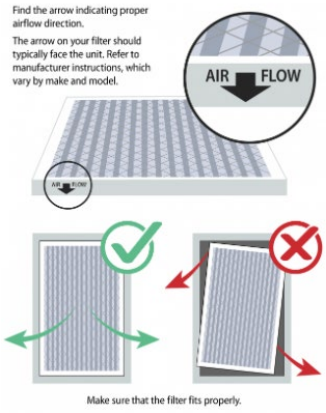
Read more: Journal of Occupational and Environmental Hygiene, Published online: 05 May 2023 (Available with an AIHA membership

Ventilation

CDC Updates Recommendations on Building Ventilation

Occupied buildings should undergo at least five clean air changes an hour, according to updated ventilation guidance from the Centers for Disease Control and Prevention.

The agency says air changes can be accomplished via “any combination of central ventilation system, natural ventilation or additional devices that provide equivalent [air changes per hour] to your existing ventilation.” CDC explains on



its website how to calculate air changes per hour.

Another updated recommendation: installing air filters with a minimum efficiency reporting value of 13 or higher. The revised guidance also addresses post-occupancy flushing of building air and details cost considerations for ventilation strategies.

Read more:
https://www.safetyandhealthmagazine.com/articles/cdc-updates-recommendations-on-building-ventilation

PPE

Researchers Pin Down PFAS Prevalence in Firefighter Gear

A firefighter's protective clothing, called turnout gear, is essential for operating in the dangerous conditions of a fire. However, the firefighting community has raised concerns regarding the presence of a class of chemicals called per- and polyfluoroalkyl substances (PFAS) — some of which have been linked to cancer — in the gear.

Until recently, the public has had little information regarding the specific types, quantities and location of PFAS in firefighter equipment, but now, a new report sheds light.

Researchers at the National Institute of Standards and Technology (NIST) have conducted an in-depth examination of a range of textiles used in turnout gear coats and pants, which are constructed in three layers. The results showed that the amount of PFAS present varies widely between

manufacturers and layers, with the highest PFAS concentrations observed in the outermost two. The results of the study suggest that selecting optimal combinations of fabrics for each layer could significantly reduce the amount of PFAS present in turnout gear.

Read more: https://www.nist.gov/news-events/news/2023/05/researchers-pin-down-pfas-prevalence-firefighter-gear

Noise

About One in Three Adults Exposed to Risky Levels of Noise, Apple Study Finds

According to a study Apple conducted using data from its smartwatch, many adults are exposed to excess noise, which can lead to hearing loss and more.

The world is loud. For some people, depending on where you live, your job and other factors, it's even louder. Add to the background noise the current status quo of headphones, earphones and the constant stream of music and video straight into your ears, and you have ripe pickings for a population study on how noise will impact hearing over time.

Apple, which launched its health study initiatives in 2019 using health data collected from contributing users' iPhones and Apple Watches, released an update last month on its hearing research, which used data from about 130,000 participants between November 2019 and December

2022. The most recent study update, in partnership with the University of Michigan, looked at sound exposure across the US and Puerto Rico -- particularly noises above 70 decibels, which is the level that can increase risk of hearing loss over time.

Read more: https://www.cnet.com/health/medical/about-one-in-three-adults-exposed-to-risky-levels-of-noise-apple-study-finds/

Preventive Medicine

Open A Window for Better Sleep? Study Explores

Better work performance could be tied to the air quality in your bedroom while you sleep, a team of Danish researchers has concluded.

The researchers conducted a field intervention of 40 bedrooms in Denmark over a two-week period and tracked participants' sleep quality via a wearable monitoring device. The participants also kept an electronic log of their daily activities and sleep. Each morning, they underwent a three-minute cognitive-abilities test.

With windows open, 87% of the participants said they experienced deep sleep, compared with 70% of those who slept with their windows closed. The next morning, participants who slept with an open window also performed better on the cognitive test.

Read more:
https://www.safetyandhealthmagazine.com/articles/open-a-window-for-better-sleep-study-explores

A Simple Method to Reduce Alcohol Absorbed from Alcohol-Based Disinfectants Used on Incubators

Neonatal incubators are considered the first home of infants born prematurely, keeping them warm and protecting them from possible infections. To further protect them from infectious pathogens, alcohol-based disinfectants are frequently used. However, new research from the University of Tsukuba has found an association between the concentration of evaporated alcohol from alcohol-based disinfectants in

incubators and the amount of alcohol in premature infants.

The use of alcohol-based disinfectants (ABDs) in products, such as alcohol hand sanitizers and alcohol prep pads, is the best defense against infection which must be avoided when caring for premature babies in neonatal intensive care units (NICUs).

Read more: https://medicalxpress.com/news/2023-05-simple-method-alcohol-absorbed-alcohol-based.html

Study Shows Cigarette Butts Leak Deadly Toxins into the Environment

Cigarette filters are the world's most common form of litter. Researchers from the University of Gothenburg can now show that the filters leak thousands of toxins and plastic fibers that are toxic to aquatic larvae. The researchers are therefore calling for these filters to be completely banned.

On the footpath, at the bus stop, in the park and on the beach. You can hardly avoid seeing cigarette butts in the streetscape. And these butts aren't just butt-ugly to behold—they're also really bad for the environment. A research group at the University of Gothenburg has shown in a study that microfibers and the chemicals that leak out of the filters in cigarette butts are toxic to aquatic larvae.

Read more: https://phys.org/news/2023-05-cigarette-butts-leak-deadly-toxins.html

New App Aims to Boost Shift Workers' Sleep and Well-Being

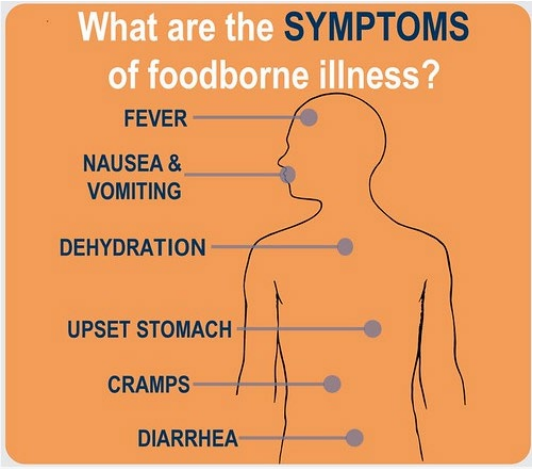
A mobile app designed to help shift workers manage their sleep cycles to enhance their health and mood is available for use.

Developed by researchers at Monash University's Turner Institute for Brain and Mental Health, the Slidrap eepSync app allows users to input work and social schedules, as well as data on sleep/wake time cycles and mood, to create personalized, biological recommendations for sleep timing.

During a two-week trial of the app that involved 27 shift workers, the Monash team found that users slept 29 minutes longer a night, on average. More than 80% of the participants said SleepSync helped improve their quality of sleep, while 70% reported increased ease in falling asleep.

Read more:
https://www.safetyandhealthmagazine.com/articles/23952-new-app-aims-to-boost-shift-workers-sleep-and-well-being

40% Of US Foodborne Restaurant Outbreaks Traced to Sick Workers



Forty percent of US foodborne illness outbreaks at restaurants and other food-serving establishments from 2017 to 2019 were related to a sick worker, according to a study published today in Morbidity and Mortality Weekly Report.

Researchers from the Centers for Disease Control and Prevention (CDC) led the study, which involved collecting environmental health data during the investigation of 800 foodborne illness outbreaks at 875 retail food establishments reported to the National Outbreak Reporting System (NORS) by 25 state and local health departments from 2017 to 2019.

Most jurisdictions' food-safety regulations are based on the US Food and Drug Administration (FDA) Food Code, recommendations designed to reduce foodborne illness in retail establishments.

The study used environmental health data, which are usually only minimally reported to NORS, from the National Environmental Assessment Reporting System (NEARS). Since it was established in 2014, NEARS has received environmental health data on foodborne illness outbreaks from 29 health departments.

Read more:
https://www.cidrap.umn.edu/foodborne-disease/40-us-foodborne-restaurant-outbreaks-traced-sick-workers

Experts Say It's Not Yet Time to Take Off Masks in the Health Care Setting

A new commentary from infectious disease experts at George Washington University School of Medicine and the National Institutes of Health (NIH) says for patient safety, masking should continue in health care settings. This message conflicts with a recent commentary from authors from eight U.S. institutions suggesting that the time for universal masking is over. The commentary is published in Annals of Internal Medicine.

Masking has been a controversial mitigation strategy during the COVID-19 pandemic because high-quality evidence of efficacy is lacking and because the topic has become highly politicized. Regardless, real-world experience demonstrates the effectiveness of mask-wearing in clinical settings where

data shows that transmission from patient-to-staff and staff-to-patent, when both are masked, is uncommon. Since health care personnel report being driven to show up for work even when they are ill themselves, the argument in support of mask-wearing becomes even more compelling.

Read more:
https://medicalxpress.com/news/2023-05-experts-masks-health.html

Environmental Health

Could Plastic Recycling Facilities Be Contributing to the Microplastics Pollution Problem?

Earlier this month, a team of researchers out of the UK, Canada, and New Zealand published a first-of-its-kind study in the peer-reviewed Journal of Hazardous Material Advances, examining the microplastics pollution potential for plastic recycling facilities. The study found that the recycling process, even with plastic pollution mitigation and high removal

efficiencies, might potentially discharge tons of microplastics into waterways.

The purpose of the study was to identify if the state-of-the-art unnamed UK plastic recycling facility (PRF) subject to the study discharged microplastics into wash water, "to consider the effectiveness of the filtration system in mitigating overall and small particle microplastics quantities in PRF wash water," and to "highlight PRFs as a potential source of microplastics pollution."

Read more
https://www.jdsupra.com/legalnews/could-plastic-recycling-facilities-be-3045576/

New Nanoparticle-Coated Sponge Aids in the Recovery of Heavy-Metal Toxins

The researchers conducted a proof-of-concept experiment to test the effectiveness of their new sponge on tap water contaminated with more than 1 part per million of lead. After using the sponge once, the lead levels in the water were reduced to below detectable levels.

The new sponge developed by Northwestern University engineers can remove metals from contaminated water, including toxic heavy metals like lead and critical metals like cobalt, leaving safe and drinkable water behind. In experiments, the sponge was tested on highly contaminated tap water, and after one use, it filtered lead to below detectable levels. Additionally, the researchers were able to recover metals and reuse the sponge for multiple cycles.

The new sponge has potential for use in home water filters or large-scale environmental remediation efforts.

R*ead more*:
https://www.azonano.com/news.aspx?newsID=40237

New York City Local Law 97: A Groundbreaking Climate Change Regulation for the Real Estate Industry

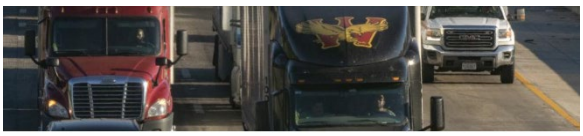
Buildings account for more than 70% of the greenhouse gas emissions in New York City (NYC). To address this problem, NYC has enacted a first-of-its-kind regulation, Local Law 97 (LL97), which establishes increasingly stringent emissions caps on approximately 40,000 buildings in NYC starting in 2024 until 2050, requiring property owners to either retrofit their buildings in order to comply with the law or face a financial penalty. LL97 was a key piece of legislation passed under the Climate Mobilization Act of 2019 (CMA), a set of local laws designed to enable NYC to achieve its goal of carbon neutrality. As a result of LL97, carbon emissions produced by covered buildings under the law are expected to decrease by 40% by 2030 and by 80% by 2050.

Read more:
https://www.jdsupra.com/legalnews/new-york-city-local-law-97-a-5623257/

California Hits Harder on Heavy Truck Emissions

On April 28, California's Air Resources Board (CARB) approved new regulations which would phase out the sales of medium and heavy-duty combustion trucks in California by 2036. The goal is to fully transition existing fleets to zero-emissions vehicles by 2045.

Known as the Advanced Clean Fleets (ACF) regulation, the ACF is part of CARB's latest initiative to accelerate California's transition to zero-emission medium and heavy duty



vehicles. The purpose of the regulation is to protect communities that are near trucking corridors and warehouse locations. Studies have shown that these communities have higher rates of asthma and respiratory diseases than communities outside of these areas. While trucks account for only about 6 percent of the vehicles on California's

roads, they generate over 35 percent of the nitrogen oxide emissions and 25 percent of California's on-road greenhouse gas emissions.

Read more:
https://www.jdsupra.com/legalnews/california-hits-harder-on-heavy-truck-3266534/

PFAS ALERT: The Arrival of Increased Regulation in Composting

Composting has long been viewed as an important tool for sustainability with benefits for the environment as it has reduced the amount of waste incinerated or sent to landfills. Since the 1920s, municipal biosolids, or treated sewage sludge, has been used in agriculture in the United States. Only since 1993, however, has the U.S. Environmental Protection Agency provided standards for the use or disposal of biosolids, or treated sewage sludge, through land application, on a surface disposal site, or incineration, through 40 CFR Part 503 and its amendments. Today, composted biosolids are often used by farmers, homeowners for lawns and home gardens, and by landscapers and nurseries. In 2019, a study that analyzed municipal organic solid-waste composts detected per- and polyfluoroalkyl substances (PFAS) in all of them, including the most well-known and studied PFAS compounds perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS). Since that time, regulation of PFAS-laden biosolids has been considered at both the federal and state level in the United States.

Read more:
https://www.jdsupra.com/legalnews/pfas-alert-the-arrival-of-increased-3305101/

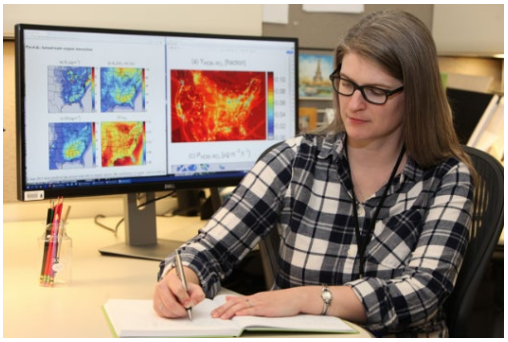
'Sustainable' Ventless Dryers May Contribute to Waterborne Microfiber Pollution

Fibers lost during the wear and care of textiles may pose a risk to the environment and human health when released into air and water. A study published in PLOS ONE by Neil J. Lant at Procter & Gamble, Newcastle Innovation Center, Newcastle upon Tyne, United Kingdom, and colleagues suggests that while condenser dryers may reduce airborne microfibers compared to vented dryers, they are a significant contributor of waterborne microfiber pollution.

Recent studies have suggested that transitioning from vented tumble dryers to condenser dryers with no exhaust outlet could reduce airborne microfiber pollution. However, their impact on waterborne microfiber pollution is unknown. To evaluate the environmental impact of condenser dryers, researchers tested loads of new, clean garments as well as dirty laundry sourced from volunteers in Newcastle upon Tyne, United Kingdom. They collected and analyzed microfibers from several components of each type of dryer.

Read more: https://phys.org/news/2023-05-sustainable-ventless-dryers-contribute-waterborne.html

Fine-Tuning Air Pollution Models



Air pollution doesn't affect everybody the same way. And in a new study, researchers developed a method to improve estimates of how, within cities, different communities are exposed to fine particulate matter (PM2.5).

Globally, PM2.5 is estimated to cause 4.7 million premature deaths each year, and in

the United States, communities of color face the most intense exposure to the chemicals. To estimate levels of exposure to air pollution, the Intervention Model for Air Pollution (InMAP) estimates air quality with fine spatial resolution, especially in densely populated areas. Because the model can assess differences in pollution exposure within cities, it can be useful in designing policies that include environmental justice. However, InMAP overestimates and underestimates specific PM2.5 chemicals: It underestimates particulate sulfate and overestimates particulate ammonium. In a new study, Gallagher and colleagues develop a method to correct those biases.

Read more: https://phys.org/news/2023-05-fine-tuning-air-pollution.html

Ergonomics

10 Jobs with High Risks for Developing Back Pain (and How to Prevent It)

In this article, we'll explore the worst jobs for back pain and the ways to mitigate potential harm while promoting proper posture and muscle balance. Here are 10 high-risk jobs for back pain.

1. Construction workers. Construction work, with all its heavy lifting and physically demanding tasks, often leads to back pain-related issues. To prevent these problems, you should practice proper lifting techniques. By bending at your knees, not your waist, you can protect your spine from unnecessary strain.

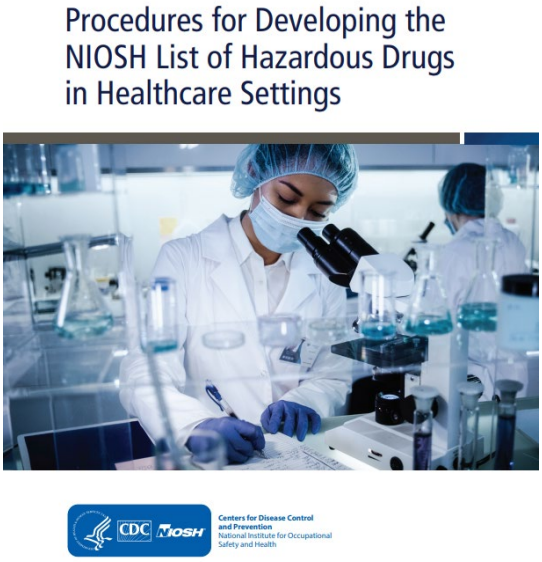
Consider using items such as supportive shoes, adjustable ladders with stable footing or tool belts that provide lumbar support. If your employer doesn't supply this equipment, it may be worth it to go out of pocket. You only have one back, and

you'll want to keep it in tip-top shape for life.

Read more: https://ohsonline.com/articles/2023/05/18/10-jobs-with-high-risks-for-developing-back-pain.aspx

Safety

Procedures for Developing the NIOSH List of Hazardous Drugs in Healthcare Settings



This document lays out the methodology the National Institute for Occupational Safety and Health (NIOSH) uses to determine if a drug meets the criteria for placement on the NIOSH List of Hazardous Drugs in Healthcare Settings. It also sets forth the process parties can use to request that a drug be added to the list or reconsidered for removal or a different placement on the list.

In 2004, NIOSH published NIOSH Alert: Preventing Exposures to Antineoplastic and Other Hazardous Drugs in Healthcare Settings. This Alert included a sample list of drugs that can be hazardous to healthcare workers who handle, prepare, dispense, administer, or dispose of these drugs. The purpose of the Alert was to increase awareness among workers in healthcare settings and their employers about the health risks posed by working with hazardous drugs and to provide them with measures for protecting their health. NIOSH has periodically updated that list from 2010 through 2016 as the NIOSH List of Antineoplastic and Other Hazardous Drugs in Healthcare Settings.

Read more:
https://www.cdc.gov/niosh/docs/2023-129/default.html

Plastic Pervasive in Food Supply, Says New Study

Micro and nanoplastics are pervasive in our food supply and may be affecting food safety and security on a global scale, a new study led by CSIRO, Australia's national science agency, has found.

The study is one of the first to analyze the academic literature on microplastics from a food safety and food security risk viewpoint, building on past studies which primarily tracked plastics in fish.

It shows that plastics and their additives are present at a range of concentrations not only in fish but in many products including meat, chicken, rice, water, take-away food and drink, and even fresh produce.

Read more: https://phys.org/news/2023-05-plastic-pervasive-food.html

On-the-Job Injuries: Report Identifies Two Vulnerable Worker Groups

Employers need to pay close attention to new and aging employees to help prevent workplace injuries, according to a report from insurance provider The Travelers Cos.

For its 2023 Injury Impact Report, Travelers examined more than 1.2 million workers' compensation claims filed between 2016 and 2020 from various businesses and industries. Findings show that employees in their first year on the job accounted for 34% of the claims and almost 7 million missed workdays because of injuries.

Meanwhile, the frequency of injury among workers 60 and older was less than that of many other age groups, but they had higher average costs per claim. For instance, the average costs of their claims were 140% higher than those of employees 18 to 24 and 15% higher than those of 35- to 49-year-olds.

Read more:
https://www.safetyandhealthmagazine.com/articles/23933-on-the-job-injuries-report-identifies-two-vulnerable-worker-groups

NIOSH Video Tells Truckers About Safe Transfer of Process Fluids

A new video emphasizes safe work practices for truck drivers transferring process fluids such as oil and gas from wells to other locations.

Developed by NIOSH, the video notes that from 2016 to 2020, at least 12 workers died while transferring fluids at well sites. The deaths resulted from cardiac events, combustion-related explosions, struck-by vehicle incidents, exposure to hydrogen sulfide and heatstroke.

During fluid transfers, flammable atmospheres present a hazard to workers, the agency warns. In addition, when fluid tanks are under pressure, hydrocarbon gases and vapors can escape, creating potentially toxic and oxygen-deficient surroundings that may cause damage to a worker's eyes, lungs, central nervous system and heart.

In the 11-minute video, NIOSH encourages employers to select and implement effective controls from the Hierarchy of Controls. Engineering controls include safely venting or containing process fluid

vapors by using a vapor recovery unit, as well as using conducting hoses and closed connections for fluid transfers. Administrative controls include worker training and workplace policies. Employers also should train workers on the proper use of personal, multiuse gas monitors and how to confirm the devices are functioning properly and placed within the worker's breathing zone.

Read more:
https://www.safetyandhealthmagazine.com/articles/niosh-video-tells-truckers-about-safe-transfer-of-process-fluids

Can Exposure to Bright Light Help Prevent Shift Worker Fatigue?

Exposing night shift workers to bright light before work begins may improve their sleep, lessen fatigue and lead to fewer errors on the job.

That's according to researchers from McGill University, who recruited 57 full-time nurses from three Montreal hospitals and divided them into two groups. One group underwent an experimental intervention of evening light exposure and morning light avoidance to improve circadian rhythm alignment. The other group modified its diets to improve alertness and reduce sleep disturbances.

Each morning and evening over a 30-day period, the researchers measured the nurses' fatigue, work-related errors, sleepiness, mood, and sleep duration and quality. The participants worked a rotating schedule of day and night shifts during the same week.

Read more:
https://www.safetyandhealthmagazine.com/articles/23929-can-exposure-to-bright-light-help-prevent-shift-workers-fatigue

More Workers Testing Positive for Marijuana, Annual Index Shows

The percentage of workers testing positive for marijuana after an on-the-job incident or injury hit a 25-year high in 2022, according to an analysis conducted by Quest Diagnostics.

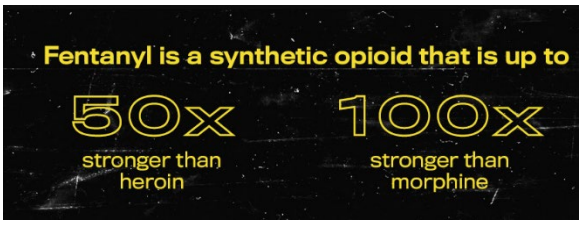
Researchers from the lab services provider examined the results of more than 10.6 million samples taken last year from the combined U.S. workforce – both the general workforce and employees in safety-sensitive jobs who undergo federally mandated drug testing (including pilots,

truck drivers and train conductors) – for the annual Quest Diagnotics' Drug Testing Index. Overall, 7.3% of the samples tested positive – up from 6.7% in 2021, for a 9% increase.

Read more:
https://www.safetyandhealthmagazine.com/articles/more-workers-testing-positive-for-marijuana-annual-index-shows

Emergency Preparedness

Fentanyl Can Be Weaponized, But Preparation Could Minimize the Damage



The widely-available drug fentanyl, already the number one killer of Americans under 50, could be weaponized and used for terroristic mass poisoning, according to health experts at Rutgers and other institutions.

"Before fentanyl, the only viable mass poisons were rare and difficult-to-access agents such as cyanide or nerve agents," said Lewis Nelson, chair of the Department of Emergency Medicine at Rutgers New Jersey Medical School and senior author of the new Frontiers in Public Health paper. "Fentanyl can be just as deadly if properly disseminated, and it's ubiquitous. A motivated person could readily obtain enough to potentially poison hundreds of people—which, uncut, would fit easily onto a teaspoon."

Read more:
https://medicalxpress.com/news/2023-05-fentanyl-weaponized-minimize.html

Deployment Health

Military Expanding the Use of Fitness Trackers to Detect Disease Outbreaks Such as COVID-19

The Pentagon is expanding the use of wearable fitness trackers to help predict outbreaks of infectious diseases such as COVID-19 as use of the technology, such as watches and rings, spreads in the military despite early security concerns.

The Defense Innovation Unit, an entity within the Pentagon focused on pairing commercially available technology with military uses, says that it had success during the pandemic in identifying infections by marrying an artificial intelligence algorithm with a commercial device.

Read more:
https://www.military.com/daily-news/2023/05/01/military-expanding-use-of-fitness-trackers-detect-disease-outbreaks-such-covid-19.html

Nanotechnology

Nontoxic Nanosystem Powder Uses Sunlight to Quickly Disinfect Contaminated Drinking Water

At least 2 billion people worldwide routinely drink water contaminated with disease-causing microbes. Now, scientists at Stanford University and SLAC National Accelerator Laboratory have invented a low-cost, recyclable powder that kills thousands of waterborne bacteria per second when exposed to ordinary sunlight. The discovery of this ultrafast disinfectant could be a significant advance for nearly 30 percent of

the world's population with no access to safe drinking water, according to the Stanford and SLAC team.
Their results are published in Nature Water ("Solar-driven efficient heterogeneous subminute water disinfection nanosystem assembled with fingerprint MoS2").

Disinfectant powder is stirred in bacteria-contaminated water to kill all bacteria Disinfectant powder is stirred in bacteria-contaminated water (upper left). The mixture is exposed to sunlight, which rapidly kills all the bacteria (upper right). A magnet collects the metallic powder after disinfection (lower right). The powder is then reloaded into another beaker of contaminated water, and the disinfection process is repeated (lower left). (Image: Tong Wu/Stanford University)

Read more:
https://www.nanowerk.com/nanotechnology-news2/newsid=63046.php

Regulatory Research & Industrial Hygiene Professional News

States

State Contests Ruling on Workers' Right to Be Heard on Safety Issues

The state of Iowa is challenging a ruling that it violated prison workers' right to be heard on issues of personal safety and assaults on the staff committed by inmates.

In a petition filed last week in Polk County District Court, Attorney General Brenna Bird, representing the state, is arguing that state agencies are under no legal obligation to meet with their employees over workplace safety concerns.

The dispute stems from an event that took place in the fall of 2017, when Neil LeMaster and Todd Eaves, union representatives and correctional officers at Iowa State Penitentiary, attempted to speak to the then-warden, Patti Wachtendorf, about an increase in altercations with inmates and concerns for workers' safety.

Read more:
https://iowacapitaldispatch.com/2023/05/29/state-contests-ruling-on-workers-right-to-be-heard-on-safety-issues/

New York Becomes First US State to Ban Gas in New Buildings

New York has become the first US state to pass a law banning gas stoves and other fossil fuels in most new buildings, in a victory for environmental activists.

The legislation adopted by lawmakers in the Democratic-run state legislature late Tuesday will require newly built homes to be all-electric in three years' time.

The move aims to tackle climate change by reducing New York's dependence on natural gas.

Read more:
https://phys.org/news/2023-05-york-state-gas.html

DOT

PHMSA Releases Proposed Rules for Gas Pipeline Leak Detection and Repair Addressing Both Pipeline Safety and Environmental Protection

On May 4, 2023, the Department of Transportation's (DOT) Pipeline and Hazardous Materials Safety Administration (PHMSA) issued a long-awaited notice of proposed rulemaking (NOPR) titled "Pipeline Safety: Gas Leak Detection and Repair" to implement congressional mandates regarding methane emissions reductions from new and existing natural gas transmission, distribution and gathering

pipelines, as well as liquefied natural gas (LNG) facilities. Section 113 of the Protecting our Infrastructure of Pipelines and Enhancing Safety Act of 2020 (P.L. 114-183; PIPES Act of 2020) had directed PHMSA to reduce methane leaks as part of its traditional role as a pipeline safety regulator, and as an environmental protection measure, making this the first proposed PHMSA rule specifically focused on environmental protection as an integral component of the agency's pipeline safety mission.

Read more:
https://www.jdsupra.com/legalnews/phmsa-releases-proposed-rules-for-gas-6828320

FAA

FAA Issues Plan for Transition to Fluorine-Free Firefighting Foam

On May 8, FAA published its Aircraft Firefighting Foam Transition Plan, which outlines additional information, timelines, and preparatory steps for airports to consider as the federal government's search for PFAS-free firefighting foam continues. The plan, which was required by Congress in 2022, provides an important "next step" in helping airports who wish to transition from PFAS containing foams, but, importantly, does not mandate such a transition.

As we've covered previously, the Department of Defense (DoD) and Federal Aviation Administration (FAA) have been investigating fluorine free foam (F3) replacements for currently used aqueous film forming foam (AFFF), which contains per- and polyfluoroalkyl substances (PFAS).

Read more:
https://www.jdsupra.com/legalnews/faa-issues-plan-for-transition-to-3747436/

OSHA

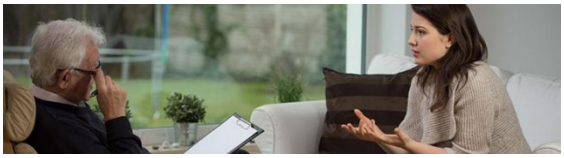
Majority of States Have Legalized Marijuana, But OSHA's Post-Incident Drug-Testing Guidance Hasn't Changed

As of May 1, 2023, marijuana had been legalized for medicinal or recreational use, or both, in thirty-eight states. Some 35–55 million Americans report using marijuana two or more times per month. According to published reports, drug tests administered by one large national testing laboratory returned the highest rate of marijuana positive tests since 1997. Accommodation, food services, and retail trade employees led the various industry sectors with an 8.1 percent positivity rate. Transportation and warehouse workers weren't far behind at 6.4 percent. In addition to marijuana, there has been a push to legalize other drugs, such as in Oregon, where some "hard

drugs" in small quantities have been decriminalized.

Read more:
https://ogletree.com/insights/majority-of-states-have-legalized-marijuana-but-oshas-post-incident-drug-testing-guidance-hasnt-changed/

Mental Health Is Next Target for Workplace Safety Advocates (1)



- Proponents say OSHA mental health guidance insufficient
- Enforcement faces tough burden of proof in court

Mental health is poised to be the next litigation frontier for workplace safety and health as supporters push OSHA to use its enforcement powers to protect workers from stress on the job.

The US Occupational Safety and Health Administration is already mounting voluntary suicide prevention and mental health awareness campaigns, but for at least some groups, that's not enough. "Our most basic argument is that worker safety and health includes mental safety and health," said Reed Shaw, policy counsel with Governing for Impact in Washington, D.C.

Read more:
https://news.bloomberglaw.com/safety/mental-health-becomes-next-target-for-workplace-safety-advocates

NIOSH

Managing Hazardous Drug Exposures: Information for Healthcare Settings

This document contains risk management information and a Table of Control Approaches describing some of the possible scenarios that workers may encounter in healthcare settings when handling hazardous drugs. The potential exposure of workers from handling a hazardous drug depends on several factors unique to each work setting. Such factors include: (1) the dosage form of the drug, (2) the routes of exposure, (3) the frequency, duration, and magnitude of exposure, (4) work practices, and (5) the presence or absence of any exposure controls such as engineering controls, administrative controls, or personal protective equipment. The National Institute for Occupational Safety and Health (NIOSH) encourages healthcare settings to conduct a facility-specific assessment to determine the most effective exposure control strategies for controlling the risks identified in the assessment.

Read more:
https://www.cdc.gov/niosh/docs/2023-130/default.html

EPA

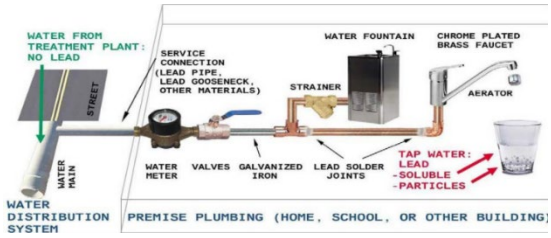
EPA Proposes Ban on Common Solvent and Processing Aid Methylene Chloride

In a proposed rule published on May 3, the U.S. Environmental Protection Agency recommended a ban on most uses of methylene chloride (also called dichloromethane), a common solvent and processing aid. It is used in a variety of consumer and commercial applications including adhesives and sealants, automotive products, and paint and coating removers. The chemical was manufactured in significant volumes — the total aggregate production volume ranged from 100 million to 500 million pounds between 2016 and 2019, according to Chemical Data Reporting (CDR) – so this ban, if promulgated, would have a substantial impact on many industrial sectors.

Read more:
https://www.jdsupra.com/legalnews/epa-proposes-ban-on-common-solvent-and-3800551/

Study Reveals EPA's Lead and Copper Rule Yields $9 Billion in Health Benefits, Exceeding Estimates

The EPA's Lead and Copper Drinking Water Rule Revision (LCRR) costs $335 million to implement while generating $9 billion in health benefits annually—far exceeding the EPA's public statements that the LCRR generates $645 million in annual health benefits, according to a new study from researchers at Harvard T.H. Chan School of Public Health. The researchers also estimate that the LCRR generates at least $2 billion in infrastructure benefits—something the EPA has never calculated—bringing its total benefit to cost ratio to at least 35:1, compared to the EPA's stated benefit to cost ratio of 2:1.



Read more: https://phys.org/news/2023-05-reveals-epa-copper-yields-billion.html

This monthly summary is published by the Ergonomics and Industrial Hygiene Management Program for the Defense Centers for Public Health – Aberdeen.

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https://phc.amedd.army.mil/news/Pages/PublicationDetails.aspx?type=Army%20Industrial%20Hygiene%20News%20and%20Regulatory%20Summary

Professional Development and Career Programs

Career Program (CP) 12 is now Installations Career Field (ICF) Safety & Occupational Health. The career management of the Fire, Occupational Health, and Safety community emphasizes enhancing technical, managerial, leadership skills for Department of the Army Civilians in 25 occupational series that meet the Army's current and future Fire, Occupational Health & Safety needs.

Fire, Occupational Health & Safety Functional Community

- Safety
- Industrial Hygiene
- Health Physics
- Safety Engineers
- Fire Protection
- Aviation
- Gas and Radiation Detection
- Explosives Safety
- Chemical Plant Operation
- Emergency Management
- General Administration