Sensor-Triggered Sampling to Determine Instantaneous Airborne Vapor Exposure Concentrations

It is difficult to measure transient airborne exposure peaks by means of integrated sampling for organic chemical vapors, even with very short-duration sampling. Selection of an appropriate time to measure an exposure peak through integrated sampling is problematic, and short-duration time-weighted average (TWA) values obtained with integrated sampling are not likely to accurately determine actual peak concentrations attained when concentrations fluctuate rapidly. Laboratory analysis for integrated exposure samples is preferred from a certainty standpoint over results derived in the field from a sensor, as a sensor user typically must overcome specificity issues and a number of potential interfering factors to obtain similarly reliable data. However, sensors are currently needed to measure intra-exposure period concentration variations (i.e., exposure peaks). In this work, the digitized signal from a photoionization detector (PID) sensor triggered collection of whole-air samples when toluene or trichloroethylene vapors attained predetermined levels in a laboratory atmosphere generation system. Analysis by gas chromatography-mass spectrometry of whole-air samples (with both 37 and 80% relative humidity) collected using the triggering mechanism with rapidly increasing vapor concentrations showed good agreement with the triggering set point values. Whole-air samples (80% relative humidity) in canisters demonstrated acceptable seventeen day storage recoveries, and acceptable precision and bias were obtained. The ability to determine exceedance of a ceiling or peak exposure standard by laboratory analysis of an instantaneously-collected sample, and to simultaneously provide a calibration point to verify the correct operation of a sensor was demonstrated. This latter detail may increase the confidence in reliability of sensor data obtained across an entire exposure period.

Read more: Journal of Occupational and Environmental Hygiene, Accepted author version posted online: 26 Mar 2018 (Available with AIHA membership)
Laboratory Evaluation of a Low-Cost, Real-Time, Aerosol Multi-Sensor

Exposure to occupational aerosols are a known hazard in many industry sectors and can be a risk factor for several respiratory diseases. In this study, a laboratory evaluation of low-cost aerosol sensors, the Dylos DC1700 and a modified Dylos known as the Utah Modified Dylos Sensor (UMDS), was performed to assess the sensors' efficiency in sampling respirable and inhalable dust at high concentrations, which are most common in occupational settings. Dust concentrations were measured in a low-speed wind tunnel with 3 UMDSs, collocated with an aerosol spectrometer (Grimm 1.109) and gravimetric respirable and inhalable samplers. A total of 10 tests consisting of 5 different concentrations and 2 different test aerosols, Arizona road dust and aluminum oxide, were conducted. For the Arizona road dust, total particle count was strongly related between the spectrometer and the UMDS with a coefficient of determination (R²) between 0.86–0.92. Particle count concentrations measured with the UMDS were converted to mass and also were related with gravimetrically collected inhalable and respirable dust. The UMDS small bin (i.e., all particles) compared to the inhalable sampler yielded a R² of 0.86–0.92 and the large bin subtracted from the small bin (i.e., only the smallest particles) compared to the respirable sampler yielded an R² of 0.93 to 0.997. Tests with the aluminum oxide demonstrated a substantially lower relationship across all comparisons. Further, assessment of intra-instrument variability was consistent for all instruments but inter-instrument variability indicated that each instrument requires its own calibration equation to yield accurate exposure estimates. Overall, it appears that the UMDS can be used as a low-cost tool to estimate respirable and inhalable concentrations found in many workplaces. Future studies will focus on deployment of a UMDS network in an occupational setting.
Diesel Engine Exhaust Exposure in Underground Mines: Comparison between Different Surrogates of Particulate Exposure

Exposure to diesel particulate matter (DPM) is frequently assessed by measuring indicators of carbon speciation, but these measurements may be affected by organic carbon (OC) interference. Furthermore, there are still questions regarding the reliability of direct-reading instruments (DRI) for measuring DPM, since these instruments are not specific and may be interfered by other aerosol sources. This study aimed to assess DPM exposure in two underground mines by filter-based methods and DRI; and to assess the relationship between the measures of elemental carbon (EC) and the DRI to verify the association of these instruments to DPM. Filter-based methods of respirable combustible dust (RCD), EC and total carbon (TC) were used to measure levels of personal and ambient DPM. For ambient measurements, DRI were used to monitor particle number concentration (PNC; PTrak), particle mass concentration (DustTrak DRX and DustTrak 8520) and the submicron fraction of EC (EC₁; Airtec). The association between ambient EC and the DRI was assessed by Spearman correlation. Geometric mean concentrations of RCD, respirable TC (TCᵣ) and respirable elemental EC (ECᵣ) were 170 µg/m³, 148 µg/m³ and 83 µg/m³ for personal samples, and 197 µg/m³, 151 µg/m³ and 100 µg/m³ for ambient samples. Personal measurements had higher TCR:ECR ratios compared to ambient samples (1.8 vs 1.50) and weaker association between ECR and TCR. Among the DRI, the measures of EC₁ by the Airtec (ρ = 0.86; P<0.001) and the respirable particles by the DustTrak 8520 (ρ = 0.74; P<0.001) showed the strongest association with EC, while PNC showed a weak and non-significant association with EC. In conclusion, this study provided important information about the concentrations of DPM in underground mines by measuring several indicators using filter-based methods and DRI. Among the DRI, the Airtec proved to be a good tool for estimating EC concentrations and, although the DustTrak showed good
Chrysotile asbestos fibers were added to roofing products, including roof cement, for several decades. The fibers were described as “encapsulated” and therefore incapable of being released, an assertion that is disproved by the study reported herein. Three test panels of roof cement from the original container were exposed to ambient weathering in 2015 and 2016. Two panels were then sampled using the ASTM D5755 microvacuum method. Sampling revealed a light brown sub-layer under the dark brown surface layer, both of which crumbled and became friable during sampling. Analysis of the microvacuum samples with transmission electron microscopy showed that the material on the two panels contained 4,432,000 and 3,320,000 asbestos structures per cm² with nearly all of the structures consisting of fibers less than 5 µm long. Energy dispersive spectrometry determined that none of the fibers reported were coated with asphalt. The presence of free fibers were confirmed by direct examination of the surfaces of the panels and of dust released from handling the panels via scanning electron microscopy. This study confirmed the releasability of uncoated asbestos fibers from dried roof cement that was indicated in two previous studies published in 2007 and 2010. These results suggest that the finding of the 5th Circuit Court in 1997 that uncoated airborne asbestos fibers cannot be released from roof cement, and therefore do not present a potential exposure by inhalation, was erroneous in retrospect. The exemption of roof cement from regulation under the Occupational Safety and Health Administration Construction Industry Standard for asbestos by the Court should not be relied on by employers of workers who remove weathered asbestos-containing roof cement, and precautions should be taken against exposure to airborne asbestos fibers during this work.
Occupational Exposure Monitoring Data Collection, Storage, and Use among State-Based and Private Workers' Compensation Insurers

Despite substantial financial and personnel resources being devoted to occupational exposure monitoring (OEM) by employers, workers' compensation insurers, and other organizations, the United States (US) lacks comprehensive occupational exposure databases to use for research and surveillance activities. OEM data are necessary for determining the levels of workers' exposures; compliance with regulations; developing control measures; establishing worker exposure profiles; and improving preventive and responsive exposure surveillance and policy efforts. Workers' compensation insurers as a group may have particular potential for understanding exposures in various industries, especially among small employers. This is the first study to determine how selected state-based and private workers' compensation insurers collect, store, and use OEM data related specifically to air and noise sampling. Of 50 insurers contacted to participate in this study, 28 completed an online survey. All of the responding private and the majority of state-based insurers offered industrial hygiene (IH) services to policyholders and employed one to three certified industrial hygienists on average. Many, but not all, insurers used standardized forms for data collection, but the data were not commonly stored in centralized databases. Data were most often used to provide recommendations for improvement to policyholders. Although not representative of all insurers, the survey was completed by insurers that cover a substantial number of employers and workers. The 20 participating state-based insurers on average provided 48% of the workers' compensation insurance benefits in their respective states or provinces. These results provide insight into potential next steps for improving the access to and usability of existing data as well as ways researchers can help organizations improve data collection strategies. This effort represents an opportunity for collaboration among insurers, researchers, and others that can help insurers and employers while advancing the exposure assessment field in the US.

Read more: Journal of Occupational and Environmental Hygiene, Accepted author version posted online: 26 March 2018 (Available with AIHA membership)
Airborne Exposures Associated With the Typical Use of an Aerosol Brake Cleaner During Vehicle Repair Work

Many petroleum-based products are used for degreasing and cleaning purposes during vehicle maintenance and repairs. Although prior studies have evaluated chemical exposures associated with this type of work, most of these have focused on gasoline and exhaust emissions, with few samples collected solely during the use of an aerosol cleaning product. In this case study, we assess the type of airborne exposures that would be expected from the typical use of an aerosol brake cleaner during vehicle repair work. Eight exposure scenarios were evaluated over a two-day study in which the benzene content of the brake cleaner and potential for dilution ventilation and air flow varied. Both short-term (15 min) and task-based (≥1 hr) charcoal tube samples were collected in the breathing zone and adjacent work area and analyzed for total hydrocarbons (THCs), toluene, and benzene. The majority of personal (N = 48) and area (N = 47) samples had detectable levels of THC and toluene, but no detections of benzene were found. For the personal short-term samples, average airborne concentrations ranged from 3.1 – 61.5 ppm (13.8 – 217.5 mg/m³) for THC and 2.2 – 44.0 ppm (8.2 – 162.5 mg/m³) for toluene, depending on the scenario. Compared to the personal short-term samples, average concentrations were generally 2 to 3 times lower for the personal task-based samples and 2 to 5 times lower for the area short-term samples. The highest exposures occurred when the garage bay doors were closed, floor fan was turned off, or greatest amount of brake cleaner was used. These findings add to the limited dataset on this topic and can be used to bound or approximate worker or consumer exposures from use of aerosol cleaning products with similar compositions and use patterns.

Read more: Journal of Occupational and Environmental Hygiene, Accepted author version posted online: 19 April 2018 (Available with AIHA membership)
America's Nuclear Headache: Old Plutonium with Nowhere to Go

In a sprawling plant near Amarillo, Texas, rows of workers perform by hand one of the most dangerous jobs in American industry. Contract workers at the U.S. Department of Energy’s Pantex facility gingerly remove the plutonium cores from retired nuclear warheads.

Although many safety rules are in place, a slip of the hand could mean disaster. In Energy Department facilities around the country, there are 54 metric tons of surplus plutonium. Pantex, the plant near Amarillo, holds so much plutonium that it has exceeded the 20,000 cores, called “pits,” regulations allow it to hold in its temporary storage facility. There are enough cores there to cause thousands of megatons of nuclear explosions. More are added each day.


Environment, Health, and Safety vs. Demand Control Ventilation: Challenges and Opportunities

There is no replacement for safe lab practices and following the guidance of environment, health, and safety (EHS) professionals. So, is there a role for new technology and advancement in the EHS profession? And can this technology assist in making labs more intelligent and provide better worker protection?
Intelligent airflow management platforms employing demand control ventilation (DCV) technology provide the EHS teams at research centers with the ability to gather data about air quality within laboratories and to proactively identify—and, in many cases, rectify—safety concerns. These new insights offer a great opportunity for near-real-time training of desired practices and event response and greater understanding of what is happening across a large footprint of research space. Simultaneously, the integrated solution offers airflow system response and increased occupant protection by raising ventilation rates when needed.

Read more: https://www.staylegal.net/personal-protective-equipment-ppe/

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**PPE**

**Herbicides: How to Wash Contaminated Clothing**

To prevent accidental insecticide exposure, applicators need to take appropriate, precautionary steps when it comes to the care of their clothing following application, explained Adam Varenhorst, Assistant Professor & SDSU Extension Field Crop Entomologist.

“Exposure to insecticides can pose a serious health threat to the individuals working with insecticides along with their families, as families can be exposed to insecticides when contaminated work clothes are laundered at home,” Varenhorst said. In many cases, reading the insecticide label will provide the information needed regarding the use of proper personal protective equipment (PPE). Insecticide labels list the minimum required PPE that must be worn while working with insecticides to reduce exposure.

“However, even with exercising caution when mixing and applying insecticides or disposing of used PPE a person’s clothing can still be contaminated,” Varenhorst explained. “Even when label recommendations are carefully followed, and PPE was worn there is still the risk of work clothing having some insecticide residues present.”
Read more:
https://www.yankton.net/life/article_ce384804-4a91-11e8-8280-d7793a568d79.html

Hearing Loss Tied to Higher Risk of Accidental Injuries

People who have a lot of trouble hearing may be almost twice as likely to experience an accidental injury as individuals with excellent or good hearing, a U.S. study suggests each year from 2007 to 2015, researchers surveyed about 272,000 adults from across the country. Among other things, the survey asked people how they rated their own hearing and whether they had suffered an accidental injury within the previous three months.

Based on the results, they calculated that of the approximately 232.2 million people in the population, about 6.6 million experienced accidental injuries each year. Compared to people who described their hearing as “excellent,” people who reported a little trouble hearing were 60 percent more likely to have an accidental injury during the study, and people with “moderate” difficulty hearing were 70 percent more likely to have injuries.

Read more:
Some Health Care Workers Are at Risk for Hearing Loss

As many as one-third of workers in some sectors of health care and social service may have hearing loss, according to the researchers at the National Institute for Occupational Safety and Health (NIOSH) who studied audiograms from hundreds of US companies. Theirs is the first known study to estimate and compare the prevalence of noise-exposed worker hearing loss by subsector within the Health Care and Social Assistance (HSA) sector.


Nasal Cytology as a Screening Tool in Formaldehyde-Exposed Workers

Background
Workers in pathology and anatomy laboratories may be exposed to formaldehyde. An evaluation of the early effects of this substance is, therefore, paramount. This preliminary study was conducted to evaluate if nasal cytology could be used as a tool to detect changes in nasal mucosa in workers exposed to formaldehyde.

Aims to assess whether nasal cytology was able to reveal any alteration of nasal mucosa in workers exposed to formaldehyde compared to unexposed subjects, and to ascertain whether a specific pattern of alterations correlated with years of exposure in order to evaluate long-term occupational exposure effects.

Methods
The study included a group of workers exposed to formaldehyde and a group of non-exposed workers. All subjects underwent clinical examination, followed
by nasal cytology. Pathological indices from each rhinocytograms were compared between the two groups.

Read more:

**Researchers Develop Patch called “Sentinel Wrap” to Detect E. coli and Salmonella Bacteria**

Researchers at McMaster University in Canada have developed a transparent test patch called “Sentinel Wrap” that can be incorporated into food packaging to monitor for pathogens such as Salmonella and E. coli. The patch, which is printed with harmless molecules that can detect food pathogens, would trigger a signal if it detects bacteria that could be read by a smartphone. The patch doesn’t affect the food.

Read more:

**HHS Spearheads Largest Exercise for Moving Highly Infectious Patients**

The US Department of Health and Human Services (HHS) said yesterday that it began the largest ever exercise to test the nation's ability to safely and securely move patients who have highly infectious diseases to regional treatment centers.

More than 50 organizations are participating in the exercise, which is coordinated by the HHS Office of the Assistant Secretary for Preparedness and Response (ASPR). They include the State Department, the Department of Transportation, regional Ebola treatment centers, local and state health and
emergency management agencies, hospitals, airports, and nongovernmental organizations.


Following Five Healthy Lifestyle Habits May Increase Life Expectancy by Decade or More

Maintaining five healthy habits -- eating a healthy diet, exercising regularly, keeping a healthy body weight, not drinking too much alcohol, and not smoking -- during adulthood may add more than a decade to life expectancy, according to a new study led by Harvard T.H. Chan School of Public Health.

Read more: https://www.sciencedaily.com/releases/2018/04/180430075619.htm

Hidden Costs of Skin Cancer Caused by Workplace Sun Exposure Revealed

Skin cancer cases attributable to work-related sun exposure could be costing millions of dollars, and must be better addressed by policymakers. A new study, published today in the Journal of Occupational and Environmental Hygiene, has estimated the total and per-case costs of newly diagnosed non-melanoma skin cancers (NMSCs) in Canada in 2011 caused by workplace sun exposure.

Read more: https://www.sciencedaily.com/releases/2018/04/180426085524.htm
Wristbands for Research: Using Wearable Sensors to Collect Exposure Data after Hurricane Harvey

Over the course of four days in August 2017, Hurricane Harvey dropped up to 61 inches of rain on parts of Greater Houston, an area larger than New Jersey.1 During the storm, dams reached peak levels, necessitating drawdowns that swamped downstream neighborhoods well beyond the 100-year floodplain.2 Across southeastern Texas more than 300,000 homes and 500,000 vehicles were reported flooded.1

The floodwaters that swirled through many of Houston’s streets contained arsenic, lead, and dangerously high levels of Escherichia coli, among other agents.3,4

Read more: https://ehp.niehs.nih.gov/ehp3131/

Epigenetic Applications in Adverse Outcome Pathways and Environmental Risk Evaluation

The epigenome may be an important interface between environmental chemical exposures and human health. However, the links between epigenetic modifications and health outcomes are often correlative and do not distinguish between cause and effect or common-cause relationships. The Adverse Outcome Pathway (AOP) framework has the potential to demonstrate, by way of an inference- and science-based analysis, the causal
relationship between chemical exposures, epigenome, and adverse health outcomes. Read more: https://ehp.niehs.nih.gov/ehp2322/

Evaluating the Association between Artificial Light-at-Night Exposure and Breast and Prostate Cancer Risk in Spain (MCC-Spain Study)

The increase of artificial light at night (ALAN) in cities has altered the natural light levels in the nocturnal environment and extended human activities into the usually dark hours (Falchi et al. 2011). It has been estimated that more than 80% of the world population (99% of the population from the United States and Europe) and almost one-fifth of the world terrain is under light-polluted skies that suffer from an excessive, misdirected, or obtrusive artificial (usually outdoor) light (Cinzano et al. 2001; Falchi et al. 2011, 2016). Migration toward the light emitting diode (LED) technology in urban settings has resulted to an increase in ALAN and particularly an increase of the blue light spectrum due to the use of white LED as the new urban light standard (Kyba et al. 2017).

Read more: https://ehp.niehs.nih.gov/ehp1837/

Ergonomics

Ergonomic Evaluation of Slide Boards Used by Home Care Aides to Assist Client Transfers

Home care aides risk musculoskeletal injury because they lift and move clients; the body weight of most adults exceeds the NIOSH recommended limit for lifting. Methods to reduce manual patient lifting in institutional settings are often technically or economically infeasible in home care. Our goal was to identify suitable, safe, low-technology transfer devices for home care use. Sixteen experienced home care aides
performed client transfers from wheelchair to bed (upward) and bed to wheelchair (downward) in a simulated home care environment (laboratory), using four different slide boards and by hand without a device. Aides' hand forces were measured during client transfers; aides also evaluated usability of each board.

Read more: https://www2a.cdc.gov/nioshtic-2/BuildQyr.asp?s1=20050790&f1=%2A&Startyear=&Adv=0&terms=1&EndYear=&Limit=10000&sort=&D1=10&PageNo=1&RecNo=1&View=f&

Effectiveness of a Vacuum Lifting System in Reducing Spinal Load during Airline Baggage Handling

Information on spinal loading for using lift assist systems for airport baggage handling is lacking. We conducted a laboratory study to evaluate a vacuum lift system for reducing lumbar spinal loads during baggage loading/unloading tasks. Ten subjects performed the tasks using the industry average baggage weight of 14.5 kg on a typical two-shelved baggage cart with or without using the lift system (i.e. lifting technique). Repeated measures analysis of variance (2 tasks × 2 shelf heights × 2 techniques) was used. Spinal loads were estimated by an electromyography-driven biomechanical model. On average, the vacuum lift system reduced spinal compressive forces on the lumbar spine by 39% and below the 3400 N damage threshold. The system also resulted in a 25% reduction in the anterior-posterior shear force at the L5/S1 inferior endplate level. This study provides evidence for the potential to reduce spinal loads when using a vacuum lift system.

Read more: https://www2a.cdc.gov/nioshtic-2/BuildQyr.asp?s1=20051233&f1=%2A&Startyear=&Adv=0&terms=1&EndYear=&Limit=10000&sort=&D1=10&PageNo=1&RecNo=1&View=f&

Safety

Workers Memorial Day, 2018: Statement by John Howard, M.D., Director, NIOSH

Every year on April 28th, we observe Workers Memorial Day, remembering those workers who have been killed or injured on the job. This is also an opportunity to reflect
on how we, as a federal research institute, and our partners in industry, labor, academia and the safety and health practice community, can contribute to making our nation’s workplaces as safe and healthy as possible for all workers across America. On average, nearly 100 workers died on the job every week in 2016, according to the Bureau of Labor Statistics. While worker deaths in America are down on average—by about 63 percent since 1970—one death is too many.

Across occupations and industries, the risks faced by workers may range from those well-known but persistent hazards, to reemerging issues, or newly seen risks as jobs and society experiences their own shifts.

Read more:

Current Marijuana Use by Industry and Occupation — Colorado, 2014–2015

The effects of marijuana use on workplace safety are of concern for public health and workplace safety professionals. Twenty-nine states and the District of Columbia have enacted laws legalizing marijuana at the state level for recreational and/or medical purposes. Employers and safety professionals in states where marijuana use is legal have expressed concerns about potential increases in occupational injuries, such as on-the-job motor vehicle crashes, related to employee impairment. Data published in 2017 by the Colorado Department of Public Health and Environment (CDPHE) showed that more than one in eight adult state residents aged ≥18 years currently used marijuana in 2014 (13.6%) and 2015 (13.4%) (1).

Read more:
https://www.cdc.gov/mmwr/volumes/67/wr/mm6714a1.htm?s_cid=mm6714a1_w
Microlearning: A New Approach to Safety Training

An important component of the fourth industrial revolution referred to as Industry 4.0 will be the adoption of new training techniques. Leading these new techniques is a process called microlearning. The gist of this approach is to shorten, focus and increase the availability of training. Rather than having workers attend a 15-30-minute (or longer) workshop or computer-based training (CBT) module, they can access a four-minute or less module on their phone or other smart device covering one important aspect of the training. A series of these modules can replace, or be used to reinforce, the longer classroom or CBT modules. In addition to being brief and readily available, they can be re-accessed as needed to refresh the worker on the issue.


Increase Workplace Wellness to Decrease Workplace Violence

Workplace violence remains a real and increasing threat to America’s workforce. According to the U.S. Occupational Safety and Health Administration (OSHA), approximately two million workers are victims of workplace violence every year and this number is increasing. Even more alarming is that homicide is the fourth-leading cause of workplace deaths. In addition to the human toll, estimates put the total economic cost of workplace violence at over $55 billion.

Read more: http://www.ehstoday.com/safety/increase-workplace-wellness-decrease-workplace-violence
Supportive Colleagues Could be the Key to Health and Fairness at Work

According to a new study by researchers at the University of East Anglia (UEA) and Stockholm University, there is a clear link between a person's health and their perceptions of fairness at work over time. The most significant factor in that link is the amount of support a worker feels he or she gets from colleagues.

Read more: https://www.sciencedaily.com/releases/2018/03/180307095308.htm

The attitudes and behaviours of colleagues towards people returning to work from sick leave can have a big impact on whether or not a worker feels they are fairly treated by their organisation.

Emergency Preparedness

HHS Spearheads Largest Exercise for Moving Highly Infectious Patients

The US Department of Health and Human Services (HHS) said yesterday that it began the largest ever exercise to test the nation's ability to safely and securely move patients who have highly infectious diseases to regional treatment centers.

More than 50 organizations are participating in the exercise, which is coordinated by the HHS Office of the Assistant Secretary for Preparedness and Response (ASPR). They include the State Department, the Department of Transportation, regional Ebola treatment centers, local and state health and emergency management agencies, hospitals, airports, and nongovernmental organizations.
DoD: At Least 126 Bases Report Water Contaminants Linked To Cancer, Birth Defects

The water at or around 126 military installations contains potentially harmful levels of perfluorinated compounds, which have been linked to cancers and developmental delays for fetuses and infants, the Pentagon has found.

In a March report provided to the House Armed Services Committee, the Pentagon for the first time publicly listed the full scope of the known contamination. The Defense Department identified 401 active and Base Closure and Realignment installations in the United States with at least one area where there was a known or suspected release of perfluorinated compounds.

Combining NSAM and CPC Concentrations to Determine Airborne Nanoparticle Count Median Diameter: Application to Various Laboratory and Workplace Aerosols

Because nanomaterials have been increasingly developed and used in many technology and industry sectors over the last 20 years, increasing numbers of workers are likely to be exposed to airborne nanoparticles. In addition, the question of the nanomaterial characteristics that should be assessed in epidemiological studies remains open. Thus, assessing occupational exposure to airborne nanoparticles shall not only rely on mass concentration and chemical composition; key parameters, such as particle size, have to be included in measurement strategies.

We previously proposed a methodology to estimate the Count Median Diameter (CMD) of an aerosol based on the simultaneous size-integrated measurement of two particle concentrations, lung-deposited surface area and number, thanks to field-portable, commercially available aerosol instruments (Nanoparticle Surface Area Monitor/Condensation Particle Counter combination).

In addition to previous work, this study investigates the case of various polydisperse metal oxides, organic oil and salt particles with CMDs ranging from 16 to 410 nm. Once corrected, the CMDs derived from the NSAM/CPC agree within ±20% with regard to the reference electrical mobility equivalent diameter, regardless of aerosol composition, morphology, or geometric standard deviation (GSD). Furthermore, the field-applicability of the method was tested through six sets of experimental data stemming from workplace measurement campaigns where different materials were produced and handled (TiO₂, SiO₂, Ag, Multi-Walled Carbon Nanotubes — MWCNT), covering a range of CMDs between 40 and 190 nm. All situations considered, the approach based on the combination of a NSAM and a CPC leads to a satisfying estimation of particle CMD, within ±20% compared to reference CMD.

Read more: Journal of Occupational and Environmental Hygiene, Accepted author version posted online: 26 Mar 2018 (Available with AIHA membership)
The commercialization of engineered nanomaterials (ENMs) began in the early 2000's. Since then the number of commercial products and the number of workers potentially exposed to ENMs is growing, as is the need to evaluate and manage the potential health risks. Occupational exposure limits (OELs) have been developed for some of the first generation of ENMs. These OELs have been based on risk assessments that progressed from qualitative to quantitative as nanotoxicology data became available. In this paper, that progression is characterized. It traces OEL development through the qualitative approach of general groups of ENMs based primarily on read-across with other materials to quantitative risk assessments for nanoscale particles including titanium dioxide, carbon nanotubes and nanofibers, silver nanoparticles, and cellulose nanocrystals. These represent prototypic approaches to risk assessment and OEL development for ENMs. Such substance-by-substance efforts are not practical given the insufficient data for many ENMs that are currently being used or potentially entering commerce. Consequently, categorical approaches are emerging to group and rank ENMs by hazard and potential health risk. The strengths and limitations of these approaches are described, and future derivations and research needs are discussed. Critical needs in moving forward with understanding the health effects of the numerous EMNs include more standardized and accessible quantitative data on the toxicity and physicochemical properties of ENMs.

Read more:
https://www2a.cdc.gov/nioshtic-2/BuildQyr.asp?s1=20051292&f1=%2A&Startyear=&Adv=0&terms=1&EndYear=&Limit=10000&sort=&D1=10&PageNo=1&RecNo=1&View=f&
Congress Takes on Opioid Epidemic, Aims to Provide Tools for Public Health

In a recently released Center for Disease Control (CDC) report entitled “Overdose Deaths Involving Opioids, Cocaine, and Psychostimulants — United States, 2015-2016,” trends in what has become known as the “opioid epidemic” were reviewed. The data is based on statistics gathered from 1999-2015 and relies on information contained in the National Vital Statistics System. In total, 568,699 people died between 1999 and 2015 from drug overdoses in the United States. A total of 63,632 people died in 2016 and, of this number, 42,249 deaths involved an opioid. Increases in mortality rates were noted across all demographics, urbanization levels, and states. This represents a 27.9% increase in overdose mortality figures from 2015.


Department of Labor Wage and Hour Division Releases Three Opinion Letters

On April 12, 2018, the U.S. Department of Labor’s (DOL) Wage Hour Division released three opinion letters regarding the legality of certain arrangements under the Family and Medical Leave Act (FMLA), Fair Labor Standards Act (FLSA), and Title III of the Consumer Credit Protection Act (CCPA).
The first letter addresses a question commonly faced by employers—whether an employee is entitled to compensation for time spent traveling away from the employee’s home community.


OSHA

OSHA Clarifies that Employers in State Plans Must Submit Injury & Illness Data

OSHA notified employers in state plans that they must submit their injury and illness data through OSHA’s portal even if their state has not yet adopted the new requirements of the “Improve Tracking of Workplace Injuries and Illnesses” regulation. According to OSHA, “[the agency] determined that Section 18(c) (7) of the Occupational Safety and Health Act, and relevant OSHA regulations pertaining to State Plans, require all affected employers to submit injury and illness data in the Injury Tracking Application (ITA) online portal, even if the employer is covered by a State Plan that has


NIOSH

Dust Masks: When to Reuse, When to Toss Out

Disposable filtering face piece respirators (FFR), more commonly called dust masks, are the respiratory protection most used by employees in the workplace. Disposable FFRs are not intended for repeated or extensive use; yet, for reasons of expense, convenience, and supply, they often are. At
what point does a disposal FFR begin to fail to protect the worker wearing it? The National Institute for Occupational Safety and Health (NIOSH) has studied the issue and offers several


EPA Administrator Scott Pruitt has followed through on a commitment he made last month to initiate rulemaking to limit the Agency’s use of scientific information that is not accessible to the public and, therefore, not available for independent verification. Called Strengthening Transparency in Regulatory Science, the proposal seeks to ensure that the Agency’s decision making is “marked by independence, objectivity, transparency, clarity, and reproducibility.” The proposal also responds to several Executive Orders (EO) President Donald Trump issued in March 2017.

Need an 8-Hour HAZWOPER refresher that meets the requirements of OSHA 29 CFR 1910.120 and is free, self-enroll, and online? Start today at https://aiph-dohs.ellc.learn.army.mil.

To receive a course completion certificate, you are required to upload either your current 40-Hour HAZWOPER Certificate or your current 8-Hour HAZWOPER Refresher Course certificate (within the last year from the date you enter this course).

NOTE: You may be aware of an OSHA interpretation of the regulation regarding HAZWOPER refresher courses: “With regard to the meaning of “annual” refresher training, OSHA’s intent is that employees complete their refresher training within twelve months of their initial training or previous refresher training. An employee who does not receive the refresher training by their one-year anniversary date should attend the next available refresher course.” Be aware before beginning that rules regarding acceptable certificates/proof of training are spelled out very clearly, providers are not required to have flexibility within a course. Providers always have the option of being more restrictive than the OSHA standard.

START YOUR 2019 IDP NOW — ENROLLMENT OPEN AT HTTPS:AIPH-DOHS.ELLC.LEARN.ARMY.MIL
Updates to training requirements
BRAND NEW ACTEDS is coming!

### What to expect for the 0690 staff:

<table>
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<tr>
<th>COMPETENCY</th>
<th>COURSE</th>
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<tr>
<td>Ergonomics</td>
<td>40hr Applied Ergonomics Course</td>
</tr>
<tr>
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<td>Army DOEHS-IH Initial Course</td>
</tr>
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<td>MULTIPLE/ALL COMPETENCIES</td>
<td>Intermediate Industrial Hygiene Topics Course (80hr)-Phase 1 online (self-paced)</td>
</tr>
</tbody>
</table>

### What to expect for the 0640 staff:

<table>
<thead>
<tr>
<th>COMPETENCY</th>
<th>COURSE</th>
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</tbody>
</table>

Many of these are in the new online training format:
No compatibility settings adjustment
No deleting cookies/cache
No exams/survey
IH LEADER WEBINARS
Special topics for IH Leaders designed to enhance leadership skills

The DCS conference window will open for participants 15 minutes prior to the scheduled webinar time.
Copy and paste the below link into your browser to access the webinar.
https://conference.apps.mil/webconf/ManageYourIHmonster
This is a series of webinars held every other month.
The target audience is Army IH leadership staff.
Audio is available for all Webinars.
Manage Your IH Monster

Manage Your IH Monster Webinar
Commercial, (210) 249-4234
DSN, 421-3272, (312) for Overseas DSN
Conference Access Code: TBA

2018 episodes:
• Speedy Ventilation (recording available)
• Highly Hazardous Communicable Diseases - (recording available)
• Assessment Adventure - May 16, 2018 0900ET
• Business Objects Update - July 11, 2018 0900ET
• Noise Non-Pereil - September 12, 2018 0900ET

Registration
https://aiph-dohs.ellc.learn.army.mil
Manage Your IH Monster
Catch up on the 2016-2017 episodes of Registration & Recordings Currently Available
https://aiph-dohs.ellc.learn.army.mil

Previous episodes:
— Lab Interfaces
— Taming That SHOP Monster
— Taming The SEG Monster
— Don’t Be Afraid of The Big Bad Budget
— De-Mystifying The Metrics
— All About ANOVA
— Business Objects At Its Best
— Magical Medical Surveillance
— Leveraging Locations
— Reinvigorating Radiation
— Chasing Away IH Managerial Nightmares
— Data Integrity: What if IH data goes to court?
— Metrics Update
— Speedy Ventilation
— Highly Hazardous Communicable Diseases
This webinar discusses in detail specific highly hazardous communicable diseases (HHCDs) of public health significance and lessons learned from the 2014-2016 Ebola outbreak from an industrial hygiene and management perspective. Additionally, we will discuss the current capacity and capabilities of high-level isolation units in the United States to handle future HHCD events, provide resources on prevention and planning measures, and PPE challenges and potential failure points.
This monthly summary is published by the Industrial Hygiene Program Management Division for the Army Public Health Center.

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

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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.

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