

Environmental Health & Safety

SafetyMatters

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ENVIRONMENTAL
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Lab-Acquired Infection – Don't Let It Happen to You

by Christopher Aston

In 2010 and 2011 the CDC investigated a *Salmonella typhimurium* outbreak that affected 109 people in 38 states, and resulted in 13 hospitalizations and one death. The investigation found that the outbreak originated from lab-acquired infections (LAIs) involving a common, commercially available strain employed in clinical and teaching microbiology laboratories. Some who became ill were not laboratory workers but rather family members of laboratory workers who were not even infected themselves. It is likely that laboratory workers involved in transmission inadvertently carried the bacteria home on personal belongings such as clothes, bags, cell phones and other portable electronic devices. Staff at laboratories that were associated with illness were found to possess less knowledge of biosafety practices. CDC's advice following the investigation was:

- ◆ Do not allow lab coats to leave the laboratory, except for laundering, which must never be done at home.
- ◆ Do not allow food, drinks or personal items like backpacks, keys, cell phones and other portable electronic devices to be used while working in the laboratory or placed on laboratory work surfaces.
- ◆ Use dedicated writing utensils, paper, and other supplies at each laboratory station. These items should not be allowed to leave the laboratory.
- ◆ Always wash hands immediately after removing gloves and before leaving the laboratory.

Last May, a young laboratory assistant in San Francisco died from an apparent laboratory-acquired meningococcal infection. Sadly, had the individual sought medical attention sooner, they might have survived. *Neisseria meningitidis* outbreaks are rare in the US but carry a high fatality rate, with laboratory-acquired cases having a higher fatality rate than cases in the general population due to the higher inoculum concentration resulting from laboratory exposures versus traditional transmission. Meningitis can be prevented with antibiotics if caught before the bacteria become established and overt symptoms begin to appear. Ensuring your safety when working with infectious agents requires a few basic steps:

- ◆ Follow documented protocols.
- ◆ Avoid the use of sharps whenever possible.
- ◆ Be aware of the respective signs and symptoms of infection.
- ◆ Seek immediate medical attention if these become evident.

If available, staff should be vaccinated against the agent or sign a declination form as part of a medical surveillance plan. All suspected LAIs should be reported to EH&S as soon as possible after consultation with a healthcare provider. Please note, additional precautions and safety procedures may be required based on the specific agent in use or the nature of the manipulations in your protocol; consult the EH&S Biosafety Team with questions or concerns at bsim@columbia.edu.



Don't Let Mercury Slip through the Cracks by Christina Clark

REMINDER - CONVERTING COUNTS PER MINUTE (CPM) TO DISINTEGRATIONS PER MINUTE (DPM)

LABORATORY SURVEY RESULTS MUST BE REPORTED IN DPM. SURVEY METERS AND LIQUID SCINTILLATION COUNTERS (LSC) MAY NOT READ OUT DIRECTLY IN DPM. THE COUNTS PER MINUTE RECORDED FROM THE DIAL OR PRINTOUT MUST BE CORRECTED FOR THE COUNTING EFFICIENCY. DIFFERENT ISOTOPES HAVE DIFFERENT COUNTING EFFICIENCIES. PLEASE REFER TO THE EMAIL MESSAGE OF AUGUST 24, 2012 FOR SPECIFIC PROCEDURES.

For Lab Fire Safety
Prevention tips,
check out:

FDN(wh)Y Me @

<http://>

[www.ehs.columbia.edu
/FDNYMe.html](http://www.ehs.columbia.edu/FDNYMe.html)

[On-line](#)

[Chemical Waste](#)

[Pick-up](#)

[Request](#)

Form.

Mercury spills are among the most common spills that occur at research institutions and universities. Data gathered by the New York State Department of Health from 2000-2005 ranked mercury spills third in terms of the number of hazardous substance incidents reported in New York State. Columbia University's own data from 2007 - 2012 YTD ranks mercury spills as the most common incident on campus in that period, not a statistic to be proud of!

For the past decade, EH&S has endeavored to remove mercury thermometers from campus with its "give one, get one free" substitution program. EH&S has swapped more than 500 mercury thermometers for non-mercury devices, and although this equates to 500 potential mercury spills averted, EH&S finds that mercury spills continue to occur, at a frequency greater than all other hazardous materials spills.

Mercury spills are particularly, well, mercurial, when it comes to clean-up. Spilled mercury often divides into countless, tiny beads, making finding all of the released mercury difficult. Also, mercury vapor pressure is dependent upon temperature, so warmer environments will vaporize more mercury, while colder environments will vaporize less. These factors, among others, complicate the clean-up of a mercury spill. Typically, mercury spills that are either greater than a standard-sized mercury thermometer or not contained (for example, within a fume hood), will be referred to the University's emergency response contractor. This generally comes at a significant cost, but the personnel and resources needed to address such a spill are often too many to make spill response by EH&S an efficient option.

In an effort to better prepare for inevitable mercury spills and the challenges that accompany them, EH&S is undertaking a University-wide initiative and system for laboratories to "register" their mercury devices with EH&S. The Mercury Device Registration Program, which is a complement to the perennial mercury thermometer exchange program, will allow for improved tracking of mercury devices in residence and allow EH&S to focus its efforts helping those who absolutely must maintain a mercury device(s), establish safe storage and handling procedures, prepare them with necessary knowledge about immediate, defensive actions when a mercury release occurs, and ensure EH&S has adequate resources at the ready to assist laboratories in the event of an incident. The registration process is simple and can be performed on paper @ <http://ehs.columbia.edu/MercuryRegistrationForm.pdf> or via the LATCH (see "Lab Safety Assessment Tools" article). The first step in making your laboratory a mercury safe environment is to get registered today!

For more information on non-mercury alternative alcohol thermometers, please visit: <http://www.ehs.columbia.edu/News%20Letter/WI11Page3.html> and to review the *Mercury Falling* lessons-learned bulletin visit <https://ehs.columbia.edu/Bulletins.html> http://www.health.ny.gov/environmental/chemicals/hsees/mercury/mercury_spill_incidents.htm

What's New?

The EH&S has redesigned the website to be program (versus campus) specific.

Visit the EH&S website <http://ehs.columbia.edu>

What's In the Air? by Yuseph Sleem

Indoor Air Quality (IAQ) is a term which refers to the environment within and around buildings and structures, especially as it relates to the health and comfort of building occupants. IAQ is affected by a wide range of pollutants from many sources and poor IAQ may cause occupants to experience symptoms such as headache, fatigue, nausea, or skin irritation. When truly caused by the building's IAQ, these symptoms typically subside upon leaving the building. Potential sources of IAQ problems include: cigarette smoke, airborne dust and particulates, perfumes, cleaning products, microbial contaminants such as mold, vehicle exhaust, or gases such as carbon dioxide (CO₂), carbon monoxide (CO), and volatile organic compounds (VOCs) used in or around occupied spaces, as well as environmental factors such as ambient temperature, relative humidity, and ventilation.

It is important to appreciate that each IAQ investigation presents a unique set of circumstances. The mere presence or absence of one or more of the typical contaminants cannot simply be interpreted as being the cause of an IAQ problem. This is where EH&S factors in. EH&S can investigate IAQ concerns and help determine the source of an IAQ issue and recommend appropriate mitigation strategies. A typical IAQ survey may involve investigating several IAQ parameters, such as temperature, humidity, building ventilation, CO, CO₂, and VOCs levels, which EH&S can accomplish with portable, direct-reading instruments.

The objective of each IAQ survey is to identify the source and cause of the IAQ concern and take quick, corrective action. In instances where the likely resolution of an IAQ issue involves addressing ventilation concerns, including adjusting temperature, adjusting air distribution, or cleaning or maintenance of the ventilation system (e.g., cleaning supply registers), Facilities Management should be contacted directly by the occupant to coordinate these services. If IAQ issues are not resolved by Facilities making adjustments to or performing maintenance on the ventilation system, EH&S should be contacted for additional consultation.

When it comes to mold and IAQ, EH&S's strategy differs slightly from that of other contaminants of concern. As noted earlier, most contaminants are measured by direct-reading instruments or by collecting samples for laboratory analysis. Since mold spores are ubiquitous and will almost always be found in air samples and often in surface samples, sampling is not an ideal approach for an initial mold investigation. Accordingly, and in line with [NYCDOH recommendations](#), EH&S's strategy includes a visual inspection to identify the presence of mold or conditions that would encourage mold growth, such as damp or wet surfaces or materials. If found, small, isolated areas of mold growth can safely and effectively be addressed with contact disinfectants. Larger areas may require removal of the contaminated material. Since mold requires moisture and nourishment to grow, identifying the source of the moisture (i.e., leak, rainwater intrusion, condensation, excess humidity) and removing the nourishment (i.e., damp materials) is essential to correcting a mold issue. In some instances, damp materials can be effectively dried to minimize the potential for mold growth (i.e., typically within 24-48 hours of becoming wet), and in other instances they will have to be discarded. All water intrusion events must immediately be reported to Facilities Management so they can take prompt action.

**THE EH&S
LAUNCHED ITS
REDESIGNED
WEBSITE
OFFERING
NEW
FEATURES AND
ENHANCED
NAVIGATION.**

[HTTP://
EHS.COLUMBIA
.EDU](http://ehs.columbia.edu)

**NO EATING
DRINKING OR
APPLYING
COSMETICS
WHEN
WORKING IN
THE
LABORATORY**

**EH&S
Website:**
[http://www.
ehs.columbia.edu](http://www.ehs.columbia.edu)

Lab Safety Assessment Tools by Maytal Rand

EH&S is in the process of launching a variety of new and revised tools specifically aimed at raising the bar for laboratory safety. Foremost, is the release of the [Policy for Personal Protective Equipment in Research Laboratories](#) (PPE Policy), recently announced by the Executive Vice President for Research, Dr. Michael Purdy. The PPE Policy is accompanied by the new [PPE Hazard Assessment Tool](#), created to help laboratories identify the appropriate engineering controls (such as chemical fume hoods), administration controls (such as proper standard operating procedures), and personal protective equipment corresponding to their laboratory's activities. Although PPE is the "last line of defense" against potential laboratory hazards and should not be used as a substitute for other control measures, including appropriate product/process substitution, engineering controls and administrative controls, PPE is central to an individual's safety in the laboratory and must be clearly defined.

The prevailing OSHA standard for research laboratories, 29CFR1910.1450, *Occupational exposure to hazardous chemicals in laboratories* (aka the "Lab Standard"), requires that laboratories develop a Chemical Hygiene Plan. EH&S has developed the [University's Chemical Hygiene Plan](#), however it is essential that each laboratory develop a complementary, individualized plan that identifies hazards that may be encountered in that laboratory and the appropriate control measures to prevent exposures. To assist laboratories in meeting this requirement, EH&S has developed the [Lab Assessment Tool and Chemical Hygiene \(LATCH\) Plan](#), an online program to identify specific hazards, emergency equipment, PPE requirements and other important data for each laboratory. In prior years, this was accomplished on paper via Attachment I of the University's Health & Safety Manual. With the LATCH now online, a particularly helpful and convenient feature will be its ability to pull a variety of essential data from EH&S' current database (e.g., chemical fume hood and biological safety cabinet certifications, individual staff safety training compliance status, location of emergency equipment, etc.) and auto-populate this information into each laboratory's LATCH, providing significant momentum toward completion. The LATCH will incorporate the PPE Hazard Assessment Tool, allowing hazard-specific PPE determinations to be incorporated into the laboratory's individualized plan.

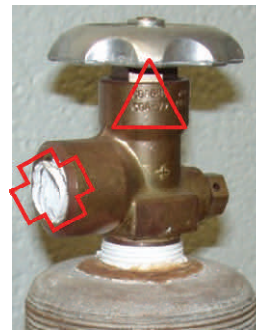
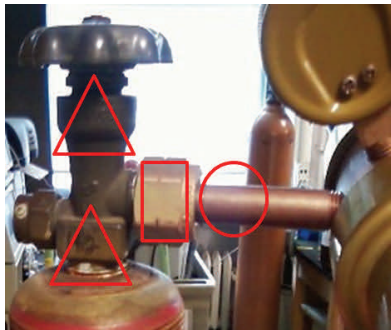
As part of the requirement for a Chemical Hygiene Plan, OSHA, as well as several other agencies, requires the development of laboratory chemical inventory. This is accomplished for each laboratory at Morningside via the ChemTracker program, and at Lamont-Doherty via the Chemical Hazardous Materials Database. Currently at CUMC chemical inventories must be prepared by each laboratory and submitted to EH&S's Research Safety Specialist at labsafety@columbia.edu by the end of each calendar year using the template @ <http://www.ehs.columbia.edu/LaboratorySafety.html>. Nevis Laboratories can also use the template used by CUMC.

Finally, an important element of the Chemical Hygiene Plan and chemical inventory requirements is the need to maintain availability and access to Safety Data Sheets (formerly referred to as Material Safety Sheets, or MSDS). EH&S has purchased ChemWatch, an online program that provides immediate access to Safety Data Sheets (SDSs) and allows each laboratory to build, save and store its own electronic SDS collection directly in the program. ChemWatch also offers comprehensive chemical safety data with invaluable and lifesaving information about the safe handling and PPE requirements for a given chemical – useful information when completing the LATCH - and what to do in the event of a chemical spill or exposure. Physician guides are also provided should medical attention be required. SDSs (i.e., ChemWatch) can be accessed @ www.ehs.columbia.edu or directly @ <http://jr.chemwatch.net/chemgold3/?X>.

Fostering a safe work environment is everyone's responsibility and EH&S will continue to develop and offer useful tools to the research community to help continue to build and maintain a strong research safety culture that Columbia University can be proud of.

Compressed Gas Cylinder Threads by Harry J. Oster

Compressed gas cylinder components contain a number of visual clues to indicate their proper use. Look carefully at a cylinder in your laboratory, focusing on the regulator connection hex nut (pictured in the circle) for example, and you will see a stamped CGA number. This number must match the stamped CGA number on the valve (pictured in the triangles); if not, cross threading and leakage can occur. Likewise, a noticeable notch on the regulator connecting hex nut (pictured in the square), indicates the threads are of reversed thread design, meaning one would need to turn them clockwise to remove the nut. When connecting these components a small 10" sized adjustable wrench is all that is needed to make the final connection; never use Teflon tape (pictured in the x) on the male or female type threads to achieve a tighter seal. Finally, always check the connection with an approved liquid indicator solution for any leaks; if leaks cannot be controlled, notify your supplier of the situation and follow their instructions.



Improved Service with "Approved" by Keith Bottum

In our pursuit of continuous quality improvement, EH&S is transitioning Regulated Medical Waste (RMW) services to a new vendor, Approved Storage & Waste Hauling (Approved), at the Morningside Campus, beginning in 2013. All service-related logistics of the RMW program will remain the same (i.e., Tuesday and Friday pick-ups), however new containers with improved features will replace the current stock of containers. Approved will also utilize a pickup attempt service notice, pictured here, for the same purpose as under the current program. A laboratory will receive the service notice if their RMW waste container(s) - either red bin or sharps - are not suitable for pickup and disposal. The container(s) cannot be picked up until identified issues are corrected. Examples of issues that will result in a service notice include:



- ◆ Container is overfilled
- ◆ Container is leaking
- ◆ Container is open in the hall while accumulation of materials occurs

To help ensure a smooth transition please review the [Segregation and Disposal of Regulated Medical Waste section of the University's Bloodborne Pathogens Exposure Control Plan](#). Containers must be packed in accordance with these guidelines for efficient service and exchange. Please contact EH&S with any questions or concerns.

EH&S Implements New Education Efforts by Marlyn Duarte

Outreach and education are critical to EH&S' mission of ensuring a safe working environment for all faculty, staff, student and visitors. The new *Lessons Learned* bulletin series provides summaries of recent laboratory incidents and near-misses, the lessons learned from the incidents, and prevention methods to decrease the likelihood of encountering a similar incident in the future. These bulletins are distributed monthly via e-mail to targeted Principal Investigators based on the nature of the incident. PIs are encouraged to spend a few minutes reviewing the *Lessons Learned* bulletin with their staff and discussing the implications for their own laboratories.

Columbia University research scientists are also helping EH&S professionals see safety from the perspective of the bench. The *Science in Safety* lecture series, which features a Principal Investigator or Post-doctoral Fellow, is an invitational event at which the safety and environmental considerations of a current scientific research project are presented to the EH&S team. The series kicked off in June, 2012 with thanks to Dr. Francesco Lotti, Department of Pathology, presenting on the science of gel electrophoresis and its applications in the Motor Neuron Center, followed in October by Dr. Dante Romanini, Department of Chemistry, discussing high performance chromatography techniques. Learning never stops!

Changes in the Radiation Dosimetry Program by Cade Register

Some minor changes are coming to the Columbia University dosimetry program. These changes are aimed at increasing the awareness of radiation workers, reducing the number of unreturned dosimeters (often called 'badges') and improving the overall efficiency of the program.

To help improve awareness of radiation exposure, Landauer, the dosimetry vendor for Columbia University, recently launched a new website and on-line interface. One of the most useful additions to the site is a service called IDR (Individual Dose Report). Using IDR, anyone that receives a badge through Landauer can check their individual dose history on-line at any time. Detailed instructions can be found @ <http://ehs.columbia.edu/IDRInstructions.pdf>. Every badge wearer is assigned a unique 'participant number' upon the issuance of their badge. This number is found on the back of every badge you receive from Columbia University (if you have a badge from a different institution, the number will be different). As part of Landauer's website improvements, all participant numbers were reassigned to solve some consistency issues. Your old number is still attached to your Landauer file and this change does not affect your dose history in any way.

In an effort to reduce the number of unreturned badges, EH&S asks that all badges be returned to the dosimetry coordinator within 15 business days of the end of the wear period. They can be sent through the Columbia University campus mail to "Cade Register, Radiation Safety, Mail Code 70" or dropped off in person at the Allan Rosenfield Building, Room 403. At the Morningside campus, the dosimetry coordinator will begin collecting badges from laboratories on the following schedule: October 10th, January 10th, April 11th and July 11th. Email reminders to return badges are sent at the beginning of each wear period and include this information.

More information can be found @ <http://ehs.columbia.edu/BadgeMC.html>. If you have any questions about badges or dose history, please contact the dosimetry coordinator at 212-305-1318.



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Do you have a suggestion for a future *SafetyMatters* article? Do you have a comment on something you just read?

Please share it with us at newsfeedback@columbia.edu