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Department of Occupationa and Environmental Safety NEWSLETTER

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Don't Drink, Don't Eat

In a laboratory setting, one of the principal routes of exposure to dangerous materials is through ingestion. Therefore, food and drink are not permittedin any laboratory in which potentially hazardous chemicals, blood or blood by-products, or radioactive materials are used. This prohibition includes any evidence of eating or drinking: candy wrappers, styrofoam cups, and hand lotion dispensers, since inspectors cannot discern whether they denote violations of rules designed to prevent accidental ingestion of hazardous materials.

The "lab area" where food and drink is prohibited should be self-explanatory. For those in the BRB, this includes the area beginning with the set of double doors leading into the lounge.

The reasoning behind these rules is also self-evident: accidental **fatal** ingestion or contamination of food can occur **easily** without realizing it, no matter how careful you think you are.

In order to ensure your compliance with these rules, make sure these guidelines are followed:

- **Establish well-defined areas** for storage andconsumption of food and beverages. This must be in a FOOD-ONLY area. There can be no chemicals in this area whatsoever.
- **Prominently mark the area** where food is permitted and post a warning sign (e.g. EATING AREA--NO CHEMICALS!). No chemicals or lab equipment should be allowed in this area.
- **Never eat food** in areas where any kind of lab operations are being carried out. Post appropriate signs designating areas.
- **Never use glassware or utensils** that have been used for laboratory operations to prepare or consume food or drink. **Similarly, laboratory refrigerators, ice chests, and cold rooms should never be used for food storage** unless clearly designated for this purpose and kept off-limits for the storage of chemicals, blood or blood by-products, and radioactive materials. Label everything prominently.

Chronic CO Vigilance

Carbon Monoxide (CO) is the most commonly encountered and pervasive poison in our environment, responsible for more deaths than any other poison. It also causes enormous suffering and morbidity in those who survive.

Annually, due to CO exposure: tens of thousands of people seek medical attention or lose several days of normal activity. More than 500 people die annually from accidental exposure. As many as 2000 people per year commit suicide using CO.

It has been known for many years that CO poisoning can produce lasting health harm, mainly through its destructive effects on the central nervous system. EPA studies found that 25-40% of people died during acute exposure, while 15-40% of the survivors suffered immediate or delayed neurophysiological deficit. Now, an emerging body of evidence suggests that longer exposures to lower levels of CO, ie. **chronic** CO poisoning are capable of producing a myriad of debilitating residual effects that may continue for days, weeks months and even years after exposure.

Obviously, CO poisoning presents the greatest

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In This Issue:

What a WASTE!

Styrofoam: How and Where?

Chemicals shipped to us from various scientific companies often come in styrofoam coolers with return postage and labeling included. Take these coolers to the Mail Room located in the Cedar Service Building to be sent back.

Note that this is the only mail room that has the capacity to handle these containers. The mail room in the Medical School, for instance, is just a sorting facility and is not large enough to handle this kind of shipping or receiving.

If a hazardous chemical was shipped in a cooler, any labels designating the container as hazardous must be removed or defaced. If the chemical bottle broke inside the cooler, it cannot be sent back -- contact DOES for proper disposal procedures if this occurs.

We encourage all researchers to mail back as many of these containers as possible. Since return postage is already included, it costs nothing to mail them back , and saves a lot of room in landfills, where such containers can take 500 years to decompose. This goes for styrofoam and EPS packing -- send them back!

Fluorescent Bulbs

You may hate their cold, unearthly glow, but fluorescent bulbs are a part of CWRU. But did you know that ALL fluorescent bulbs contain a small amount of mercury? Since mercury is a dangerous and regulated material, **fluorescent bulbs cannot be thrown in the trash** when they burn out -- the mercury within them must either be recycled or disposed of in an environmentally- sound way.

The University does have a recycling program in place to take care of these bulbs. You should take your burned-out bulbs and put them in a box (somewhere safe) where they will not be broken. When Plant Services comes to replace the bulbs, they will pick up the old ones for you. If the bulb in question is a high-power lab light -- give to DOES for disposal.

If a bulb has already broken, exercise some caution (gloves) when cleaning it up, and DO NOT throw away in the regular trash -- put it in a rigid box and notify Plant Services (x2580).

Radioactive Iodine: Reducing Volatility

The dangers of radioactive iodine are well-known: from its everday capacity as a severe skin irritant to its propensity for thyroid damage in its radioactive state, iodine in any form should be as respected as it is scientifically-useful. If you use radioactive iodine in your lab, there are some steps you can take to make its waste less dangerous.

Often, I-125 and I-131 solutions in the form of sodium iodide are used to label proteins and peptides. Once labeled, these molecules (though still requiring appropriate precautions) are relatively safe. However, the waste solutions resultant of radioactive labeling are NOT.

Any waste solution which contains free iodine isdangerous for several reasons:

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Upcoming Training Sessions

Radiation (x2906)

- **New Training:** March 14, 29 (call for times)
- **Retraining:** March 7, 22 (call for times)
- **X-ray Training:** call office to set up training

Chemical (x2907)

- **OSHA Lab Standard:** Mondays 1-3 (Service Building Conference Room)

Bloodborne Pathogen (x2907)

- **New Training:** Mondays 3-4 (Service Building Conference Room)
- **Retraining:** March 15, March 21 (call for times -- Service Building Conference Room)

Don't forget: rad re-training is now also ONLINE at our website: **http://does.cwru.edu**.

As always, call us for upcoming dates and times.

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- Spills are exacerbated by being in liquid form.
- Free iodine is extremely reactive and may combine into surfaces it touches.
- Free iodine has an appreciable vapor pressure and thus poses a SIGNIFICANT inhalation hazard to personnel and can easily contaminate sensory equipment.

A highly-effective waste apparatus to reduce these risks can be constructed as follows:

You will need:
- a 50 mL conical bottom tube,
- a tightly-packed cotton plug,
- a mixture of 10 parts glycerol, 3 parts charcoal, and 1 part disodium phosphate.

Dip the cotton into the mixture and place into the bottom tube. This tube can now be used as a waste receptacle for up to 18 mL of liquid waste and up to 20 pipet tips.

How it works: the cotton not only absorbs and arrests the liquid waste, but also reduces the possibilities of spillage. The disodium phosphate slows the creation of free iodine, and the thus-reduced levels are then cleanly absorbed by the charcoal. Lastly, the glycerol eliminates any possibility of airborne radioactive dust were the contents allowed to dry and the container to crack.

Once this waste technique is used, the contents can be safely transported to the Radiation Safety Office waste facility by the Rad Safety staff.

This method is not only easy and inexpensive, but effective. Still, since the chemical and physical properties of protein iodination do vary from lab to lab, we suggest you test this procedure with waste from your own lab before putting to constant use as an easy and effective way to reduce harmful iodine exposure.

Information from **Falk-Marzillier, J. and Mark Fitchum.** 2000. Method to Reduce Radioactive Iodine Waste. BioTechniques 28:130-131.

HOT TIPS

Read the Signs

If you work with or store radioactive materials, you should see signs and labels posted on all required equipment. Do you? There has been some concern lately about who issues safety labels; specifically, radiation safety labels.

Proper signage is a vital component of any safe lab and **is required** for all chemical, biological, and physical hazards. The following general sequence has been informally adopted by DOES to distribute signs and labels:

- Once it has been determined that an area needs signs & labels, personnel are given a "Caution Sign and Label Order Form" to indicate what signs and labels are needed.
- The form is sent to Safety Services and completed by the appropriate personnel.
- Any request for radiation hazard or radioactive material is then forwarded to Radiation Safety Operations Specialist Karen Janiga to determine if the label is warranted.
- Karen will then determine if additional labels need to be issued.

Where signs are placed is also an issue worth addressing. All signs must be in their properly-designated place. Even moving a sign from a wall onto a piece of equipment renders the area as unidentified. Call us at if you have questions about placement or consult your P.I. -- or call us at x2906.

The aim of comprehensive sign usage is for each area and piece of equipment to be easily identifiable by personnel responding when something goes wrong. The simplicity of proper signs also protects casual visitors. So double-check your existing signs; ask your personnel if they understand them or find them confusing.

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danger at home, as several recent deaths in the Chicago area can attest to. To combat CO poisoning at home, **BUY A U/L TESTED CO DETECTOR AND TEST FREQUENTLY.** But it is also IMPERATIVE to identify posible sources of CO in your lab (however small) to deter any chronic, low-grade exposure. Remember, not all labs are equipped with working CO detection devices.

CO generation is simple physical science: when a fire burns in an enclosed space, oxygen is gradually depleted and carbon dioxide is increased. The changes in both of the these gases increasingly cause the combustion process to change from one of complete combustion to one of incomplete combustion, resulting in the release of increasing amounts of CO. Thus, even a perfectly designed and adjusted burner, furnace, or heater (or **any** kind of combustion device could eventually begin producing toxic/lethal amounts of CO if it operates in a closed space and/or where insufficient fresh air is available. This can happen **QUICKLY**, often within minutes dependent on the area of the space.

Tips for Deterring CO:
- Report to your PI any condition which might make CO form or accumulate.
- Be aware of your ventilation system. Make sure your hoods are in proper working condition and have been tested. If you doubt the effectiveness of your hood, cease experimentation immediately and contact us so that we may check it out.
- Stop smoking. Think: Tobacco, when burned, releases CO which reduces the oxygen-carrying ability of the blood, even before any industrial exposure is added.
- If you get sick, tell your doctor about the possibility of exposure to CO.
- If you suspect CO poisoning, **go outside immediately**.

Symptoms:
- *Acute* CO poisoning manifests first as nausea, quickly followed by headaches, faintness or blackouts, and finally organ death and systemic morbidity. This occurs because CO decreases the total oxygen-carrying capacity of the blood by rendering a portion of the hemoglobin sites unusable for oxygen binding. If CO levels rise, the best thing to do is to go outside and stay there -- CO has a long half-life and remains in your system much longer than your initial exposure time. If you experience blackouts -- call a doctor immediately. For high dosage exposure, oxygen-inclusion therapy and hospitalization might be needed.

- *Chronic* or *Occult* CO poisoning is even more insidious, masquerading as lethargy, listlessness, lack of motivation, sleepiness, etc. and is often misdiagnosed as chronic fatigue syndrome, clinical depression, an endocrine disorder, or a viral or bacterial pulmonary or gastrointestinal infection. Symptoms may also include: chest pains, palpitations, visual disturbances, and paresthesias (an abnormal burning or prickling of the skin).

Since the changes are frequently subtle and only recognized as being related to CO exposure after a period of time -- diagnosis is difficult. If you have similar symptoms, alert your doctor to the possibility of chronic CO exposure.

Concentration		Location / Condition
CO2	860 ppm	Lecture Hall
CO2	600 - 2500 ppm	School room
CO2	9000 ppm	Nuclear submarine
CO	2.04 +/- 2.55 ppm	Average U.S. home
CO	2.5-28ppm	Offices, restaurants, bars, arenas
CO	3.1 - 7.8 ppm	Home kitchens with gas stoves
CO	1 - 5 ppm	Median outdoor conc. in cities, 1979
CO	0 - 3 -27 ppm	Max. 1 hr. average outdoor conc.
CO	0 - 3 - 22 ppm	Max. 1 hr. average indoor conc.
CO	20 ppm	Room polluted with cigarette smoke
CO	50ppm	Daily (8-hr.) limit (OSHA)

Data courtesy of The Carbon Monoxide Center at Wayne State University

The Envelope Please...

It's that time of year again: when your favorite movies (and some French subtitled one you never heard of) get nominated for various awards and honors. But instead of going to see these movies, why not also hold your own Safety Film Festival in your lab? DOES has a wide variety of films to choose from that can address any safety issue you might have -- often in colorful, exciting ways. Here is a sampling of titles and run times:

Fire Safety
- How Fast it Burned (dorm fires): 22 min.
- Fight Fire With Prevention: 12 min.
- Fire Extinguishers: Fight or Flight?: 17 min.

Confined Space Entry
- Danger Within: 12 min.
- The Confined Space Entry Series

Electrical Safety
- Shocking Experience: 12 min.
- Electricity: Unseen Danger: 22 min.
- Electrical Safety (OSHA Standard): 24 min.

Chemical Safety
- Practicing Safe Science: 20 min.
- Reactive and Explosive Matierals
- Commitment to Safety: 15 min.
- Working with Hazardous Materials: 10 min.
- The Safety Deck: 26 min.
- Hazardous Materials Transportation: 20 min

Right-to-Know
- Hazardous Communication Training

Bloodborne Pathogen Safety
- BPs: The OSHA Standard
- BP Training for the Lab (retraining): 9 min.

So they may not have the most accomplished actors or the best special effects, but you will leave having learned something. Can you honestly say the same about *Pokemon*?

All of these films and more are available to lend out to labs or departments. Call us or stop by and make it a DOES Safety Video Night.

Monitor your MONITOR:

Tips for Reducing Computer-Related Eyestrain

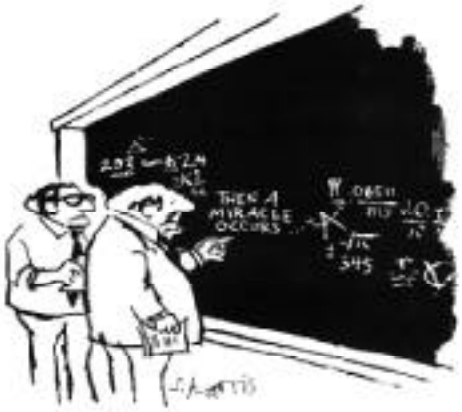
Eyestrain is a common ailment for anyone working with things up-close, whether they be test tube or a computer screen. Besides the obvious (getting an eye exam -- annually after age 40!), there are a few ways to reduce computer-related eyestrain all by yourself.

1. **Vampires Don't Have Eyestrain.** Turn your monitor off and examine the dark screen for reflections — and arrange your environment to minimize them. Can you see **yourself**? If you can, remove your image by reducing the general light level (ambient illumination). This is (unfortunately) near impossible with fluorescent lights, but remember the upswing of fluorescence -- the bright light is essential for the body to maintain its 24-hr. rhythms during the grey Cleveland winters.

2. **"Surround" Yourself.** A color scientist or video engineer uses the term "surround" to refer to the area that is perceived by your peripheral vision. Try to establish a visual surround that is quite a bit darker than the brightest white of your screen. Try also to have a visual reference to the outside world (such as a window) nearby. For many of us, this is a fantasy. So put up a picture of your dog instead.

3. **See No Pixel.** Just like photographs (or pictures of Superman) are reproduced using tiny dots, so are computer screen pictures and text -- but if you can see them you are too close! Arm's length is a good rule of thumb. If not, try a larger font or increase your viewing size percentage.

4. **Brightness is Blackness.** Anything you can do to make the screen blacker will reduce eyestrain. Switch your monitor on, turn the Picture control all the way down, and display a picture that contains as much absolute black as possible. Also use a black desktop background or a screensaver that displays mostly black. If your central screen is lighter than the margins, you have a black level problem -- adjust the display's Black Level control (misleadingly labeled Brightness) and adjust your white level accordingly so that its not *completely* dark.



"I think you should be more explicit here in step two."

Have a question? A bet to settle? A general pondering? WRITE US and we will answer **your questions** right here! Email questions to **bjr8** today.

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