



*"Safety Comes First"*

# Case Western Reserve Environmental Health and Safety

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**June/July  
2011**

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## Meet our new Executive Director!

*Meet our  
Executive  
Director*

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**Charles Hart, PhD, CIH, CSP, RS, RBP;  
Executive Director, EHS**

### Upcoming Trainings

Bloodborne Pathogens  
or Laboratory Safety:  
Tuesdays from 3:30 to  
4:45, or 11:30 to 1:00 on  
the following Fridays:  
July 8, August 12,  
September 9.

Laser Safety: 2:30 to  
4:30 on the second  
Wednesday of each  
month.

Radiation Safety: Third  
Thursday of each  
month from 2:00 to  
4:30.

As always, you can find  
our most recent  
training offerings at

[case.edu/ehs/Training/](http://case.edu/ehs/Training/)

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'messy'  
become  
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This is the first edition of the newly revised Environmental Health & Safety newsletter and my first Executive Directors column. As you may have noticed, we are no longer DOES. We are now the Department of Environmental Health & Safety (EHS), which hopefully better defines an expanding role on campus in environmental health and related issues both inside and outside the lab. Our staff is working hard to serve the campus community to help you meet your safety and regulatory responsibilities, to develop our campus 'Safety Culture', and to continue to promote CWRU's reputation of excellence in all that we do!

As a newcomer to CWRU, I would like to tell you a little bit about myself in my first column. I arrived on campus as the new Executive Director of Environmental Health & Safety in December,

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## Messy Labs

*Aisle impassible, chemical stored on floor, emergency eye wash blocked, bench cluttered, glass bottles stored on top shelf, sink filled, fume hood stuffed...*



### When does “Messy” become “Unsafe”?

Many years of observations have led to the conclusion that research labs in academia not industry are on the whole infamously *MESSY*. The title begs us to consider when that mess is unsafe. We have a plethora of examples that constitute the poor housekeeping category in our own inspection checklist (aisle impassible, chemical stored on floor, emergency eye wash blocked, bench cluttered, glass bottles stored on top shelf, sink filled, fume hood stuffed). You may even have seen this item checked once or twice on you lab inspection, to what avail. One person’s mess is another’s method!

A new text, *Laboratory Safety for Chemistry Students*<sup>1</sup>, list some interesting reasons why some labs are not in an orderly condition. First let’s define what the term housekeeping means; after all, we are not at home or in our room, (and Mom (Dad) doesn’t work here) right? Housekeeping in this context refers to “the behaviors of laboratory workers with regards to keeping labs clean and orderly enough so as not to pose hazards for the occupants.” The authors, Hill and Finster, list four factors that make academic labs prone to *messiness*: limited safety education, limited supervision, multiple lab workers, and sporadic activity.

Academic research labs are populated primarily by students who have little safety education outside of labs that are associated with courses. These labs have been optimized for safety, being well organized with relatively few chemicals on hand and the hazards have been minimized. It follows then that students entering a research lab would not readily take it upon themselves to keep a lab organized and clean.

Laboratories are generally supervised by faculty who may or may not actually spend time in the lab. Professors, like students, may have a fairly weak education in safety and unfortunately place modest value on the issues of safety, especially in comparison to the goal of producing results. Research labs often have very little supervision or guidance with regard to the issues of safety.

Academic labs are often shared by multiple students with multiple sets of chemicals and multiple sets of lab apparatus. A lack of awareness about the experiments of colleagues can lead to unsafe conditions. In many cases, when a group of students are left to work in common areas no one feels the responsibility to clean up.

Academic research is far from the daily 9 to 5 activity. Research projects

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## *Recycling Lab Plastics*

### **Recycling Laboratory Plastics**

In order to help create a sustainable culture at Case, EHS has a recycling program. Laboratory plastics can be recycled as long as they are handled properly. In order to prepare plastic chemical bottles, media bottles, old carboys, or any other plastic marked with a #1, #2, #3, or #5 recycle code you must first deface all chemical labels. The best way is to take a permanent marker and blackout any lettering on the outside of the bottle. Next, the lids can be disposed of in the regular trash and the bottle should be triple rinsed to ensure that no residue is left behind. Taking these steps helps to ensure that personnel removing the plastics are safe.

As mentioned above, most plastics marked with the appropriate recycle code can be recycled. This does not include pipette tip boxes or inserts. Many distributors like Laboratory Product Sales and USA Scientific will take pipette tip boxes and inserts which you have purchased from their company.

In order to obtain a recycle bin for your laboratory please contact Fred Peck of Custodial Services at 368-1075. All other questions can be directed to EHS at 368-2907.

### **Keep Your Lab Doors Closed**

Case Western Reserve University's Laboratory Safety Manual requires that laboratory doors must be closed at all times. In addition, National Fire Protection Association codes and standards require that laboratory doors should be kept closed. Furthermore, ventilation balance in laboratory buildings is very sensitive to air flow disruption by breaching of the separation between different "air zones".

Here are another three good reasons for keeping this good laboratory practice in place:

1. Laboratories are built to contain a chemical spill. Each lab is designed to have negative pressure and to thrust 100% of the exhaust into the outside air. If you keep your lab doors closed, chemical vapors will not escape into the adjacent hallway, offices, or labs in the event of a chemical spill. On the other hand, if you keep your lab doors open, chemicals and chemical vapors may not be easily contained and could spread throughout the whole building.
2. When a lab door is kept open, strong air currents (cross-drafts) may cause turbulence around the chemical fume hoods which may result in escaping of the

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***"Laboratory plastics can be recycled as long as they are handled properly."***

## *Meet our Executive Director*

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and started full time on January 1, 2011. I was raised in Cleveland, but have spent the last 26 years at Ohio University in Athens, Ohio. I received my BS in Environmental Health from Cleveland State University and worked for several years as an environmental sanitarian at the Summit Co. Health Dept. and as an epidemiology consultant at the Ohio Dept. of Health in Akron. I then received my MA in Health & Safety Education at Kent State and spent the next four years as Health Commissioner and Director of Environmental Health at the Ashtabula Co. Health Dept. in Jefferson, Ohio.

In 1984, I went to Ohio University in Athens as the environmental safety coordinator in charge of safety, industrial hygiene, lab safety, and biosafety programs at EHS and spent many years there developing these programs. I was ultimately promoted to Director of Environmental Health & Safety at OU. During that time I did some university teaching and consulting as well. In January 2007, I left EHS to teach part time in the environmental and occupational health

& safety program in the OU Dept. of Social & Public Health and finish my PhD in Biological Sciences. I taught nine different courses over the past three years and graduated last June with my PhD. Subsequently, I had the honor of being selected your new Executive Director of EHS here at CWRU. I am excited to be back home in Cleveland at CWRU and I look forward to working with you!

### **Where is EHS?**

If you're new to Case (or simply haven't been to visit us yet), we are located in the Service Building on the 1st floor just off Circle Drive between the Health Sciences Library to the east and the Powerhouse Building to the west. For clarity, call x2906/2907 or check our website ([case.edu/ehs](http://case.edu/ehs)) for a map and directions before your visit. Keep in mind that much of the information and services (manuals and forms, upcoming training sessions, online training sessions, past newsletters, etc.) that EHS provides can be found conveniently online at ([case.edu/ehs](http://case.edu/ehs)) at any time.

## *X-Rays and Infants*

There has been growing concern about the effects of x-rays on infants and children during clinical radiological procedures. Although the x-ray is a valuable tool for diagnosing clinical problems, technicians need to exercise proper shielding. Coning the radiation to only the body part needed for diagnosis and shielding other parts is basic. Regulating the amount of radiation is crucial since radiation effects are cumulative. This is critical with premature infants since health complications associated with early birth require more imaging.

Common radiological x-rays performed on infants and children include chest x-rays and full body images. Chest x-rays are needed to look for abnormalities of the heart, lungs, bones, or blood vessels in the chest. Full body x-rays are rarely done, but are used to diagnose bone diseases and other abnormalities in infants, newborn, premature babies and fetuses. A concern was raised at the Downstate Medical Center in Brooklyn New York when a new born received an unnecessary full body x-ray without gonadal shielding.

X-rays produced by a clinical x-ray machine produce a form of electromagnetic radiation that is ionizing radiation. Ionizing radiation is capable of removing electrons from atoms and damaging living cells and the DNA of those cells. For an adult the radiation from a clinical x-ray is unlikely to produce an adverse affect, but children and infants are at a slightly greater risk because of the possible damage to their rapidly growing cells, particularly in the gonads.

According to a study in the British Medical Journal , February 2010, childhood cancer risk may be associated with the damage of the cells through clinical diagnostic irradiation in utero and early infancy. Risk of childhood cancers was small, but found a greater risk increase in lymphoma. It was also noted that the increase in lymphoma in children exposed to x-rays may be due to other factors related to the disease.

Standards and licensure for imaging technologists and medical physicists are regulated by the state. According to the Bureau of Labor Statistics the American Registry of Radiologic Technologists (ARRT) offers voluntary certification for radiologic technologists.

*“Although the x-ray is a valuable tool for diagnosing clinical problems, technicians need to exercise proper shielding.”*





## *Fukushima's Wake*

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are squeezed into half day or hourly sessions, around classes and labs. This kind of sporadic schedule makes it easy to focus on productivity instead of safety which results with lots of equipment and chemicals just out on the bench, experiments in-progress and unsafe.

Recognition of hazards and persistence in preventing them are required to keep our laboratory safe. Most importantly you are responsible for your own safety in any lab. If the behavior of supervisors (professors) and co-workers (other students) creates an unsafe lab situation it must be addressed.

Over 150 years has passed since the idea emerged that washing hands by physicians between patients would help slow the spread of disease and now this practice is routine. One day the idea that laboratory safety training initiated by the professor is life saving to our young researchers may be the norm and just as far reaching as any credited academic course. So, taking a note from the text, Remember-

RAMP up for safety;

**R**ecognize hazards - **A**ssess risks and exposure - **M**inimize risk and accidents - **P**repare to respond to emergencies

1. Robert H. Hill and David C. Finster, Laboratory Safety for Chemistry Students, Chichester, UK: John Wiley 2010.

### **Fukushima's Wake**

There has been much concern over the last few months about the accident at the Fukushima Daiichi nuclear power plant in Japan. More followed Gerald Matisoff's detection of <sup>131</sup>I from the reactor in rainfall with his student Mary Carson.

With all the media commotion, it's easy to lose sight of the true amounts involved (*see facing page*). The amount detected in rainfall was picocurie-range: less than one of the small blue blocks in the diagram. To become sick from these amounts of radiation you would need to drink a swimming pool full of rainwater on the peak day of release.

Thankfully, the iodine has now decayed; drink all you want.

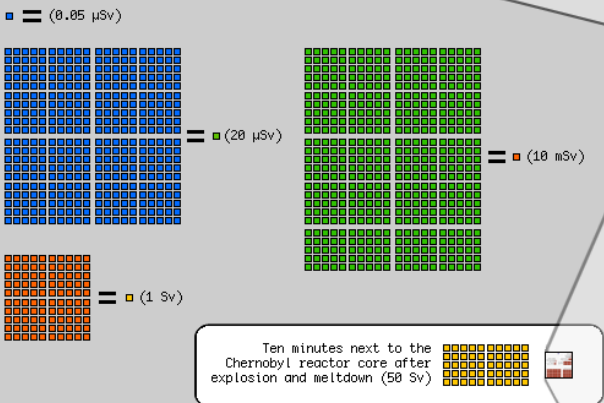
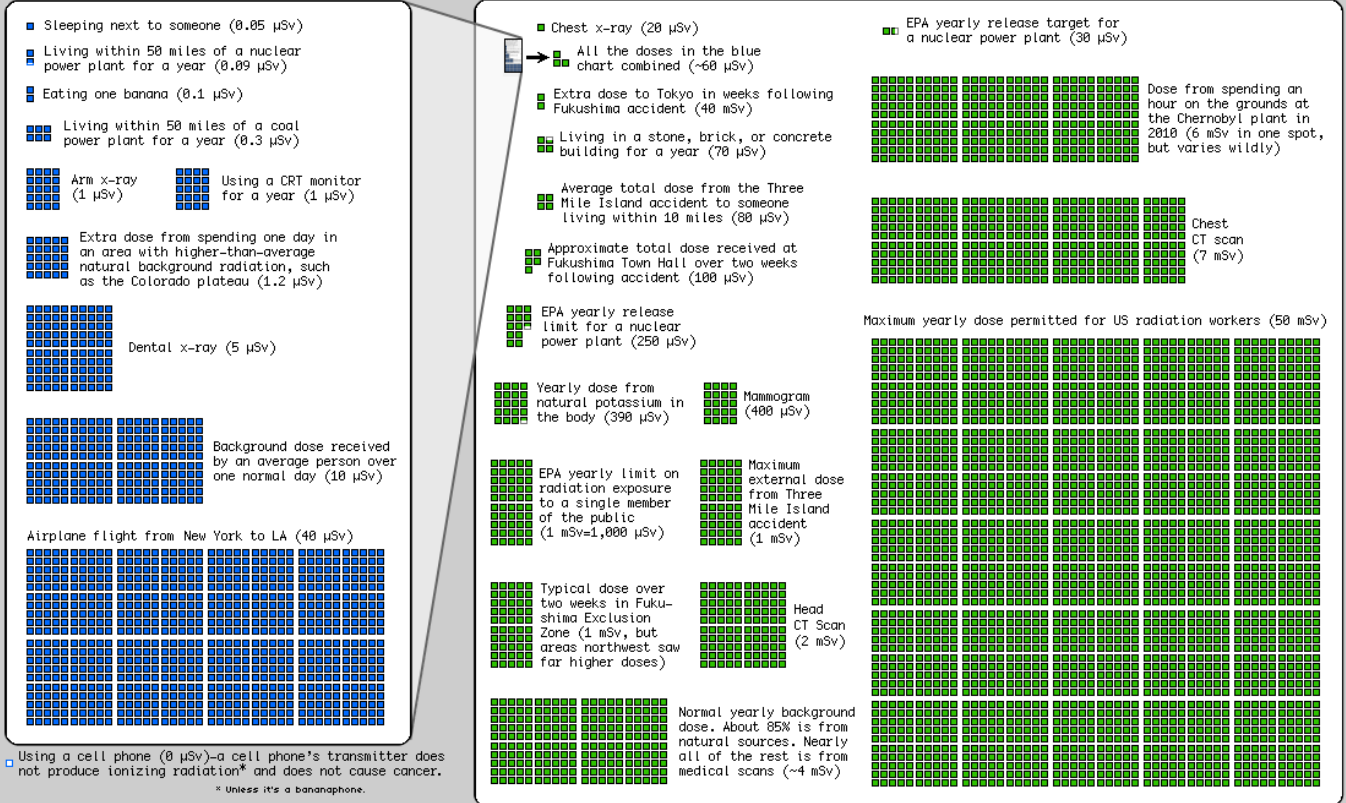
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chemical vapors from the chemical fume hood, which will in turn compromise your safety.

3. Another good reason for keeping your lab doors closed is better security and better control over possible property theft. Keeping an air of collegiality is very important in the academic environment, but collaboration should never take place at the expense of safety and security. We recommend that you keep your office doors open as much as you would like, but keep the doors to your lab closed.

# Radiation Dose Chart

This is a chart of the ionizing radiation dose a person can absorb from various sources. The unit for absorbed dose is "sievert" (Sv), and measures the effect a dose of radiation will have on the cells of the body. One sievert (all at once) will make you sick, and too many more will kill you, but we safely absorb small amounts of natural radiation daily. Note: The same number of sieverts absorbed in a shorter time will generally cause more damage, but your cumulative long-term dose plays a big role in things like cancer risk.



Sources:

- <http://www.nrc.gov/reading-rm/doc-collections/cfr/part020/>
- [www.nema.ne.gov/technological/dose-limits.html](http://www.nema.ne.gov/technological/dose-limits.html)
- [http://www.deq.idaho.gov/inl\\_oversight/radiation/dose\\_calculator.cfm](http://www.deq.idaho.gov/inl_oversight/radiation/dose_calculator.cfm)
- [http://www.deq.idaho.gov/inl\\_oversight/radiation/radiation\\_guide.cfm](http://www.deq.idaho.gov/inl_oversight/radiation/radiation_guide.cfm)
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- [http://www.mext.go.jp/component/a\\_menu/other/detail/\\_icsFiles/afieldfile/2011/03/18/1303727\\_1716.pdf](http://www.mext.go.jp/component/a_menu/other/detail/_icsFiles/afieldfile/2011/03/18/1303727_1716.pdf)
- <http://radiology.rsna.org/content/248/1/254>

Chart by Randall Munroe, with help Ellen, Senior Reactor Operator at the Reed Research Reactor, who suggested the idea and provided a lot of the sources. I'm sure I've added in lots of mistakes; it's for general education only. If you're basing radiation safety procedures on an internet PNG image and things go wrong, you have no one to blame but yourself.

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Please Remember, all back issues of the EHS Newsletter can be found online at [case.edu/ehs](http://case.edu/ehs). Simply click on the "Newsletter" link in the left-hand column!

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