

## MERCURY

EH&S published an article on mercury in one of our previous newsletters; since mercury is getting quite a bit of publicity recently (including a recent article in Synapse) we would like to keep you updated on our current mercury activities on this campus.

To refresh the memory, mercury is found in the environment in the metallic form and in different inorganic and organic forms. Most of the mercury in the atmosphere is elemental mercury vapor, while most of the mercury in water, soil, plants, and animals is inorganic and organic mercury (primarily methylmercury). Both natural processes and human activities contribute to the accumulation of mercury in the environment. Mercury is released to surface waters from naturally occurring mercury in rocks and soils, but direct application of fertilizers and fungicides and disposal of solid waste (including batteries and thermometers) to landfills can also cause environmental contamination.

The most common organic form of mercury, methylmercury, quickly enters the aquatic food chain. It is found primarily in the fish muscle. Skinning and cooking do not reduce the mercury concentration in the fillet. EPA indicated in the *Mercury Study Report to Congress* (U.S. EPA, 1997) that the typical U.S. consumer was not in danger of consuming harmful levels of methylmercury from fish and was not advised to limit fish consumption on the basis of mercury content. It is important, however, to adhere to the advisory issued by local  
(Continued on page 2, see Mercury)

## NEW SAFETY LEGISLATION

Assembly Bill 1127 authored by Assembly member Steinberg was signed into law by California Governor Gray Davis on October 6, 1999 and became effective January 1, 2000. This law eliminates the exemption for government agencies such as UCSF from paying Cal/OSHA fines for occupational safety and health violations.

Fines for such violations can be substantial:

- Non-serious violations are assessed up to \$7,000 per occurrence.
- Serious violations are assessed at up to \$25,000 per occurrence.
- Willful or repeated violations are assessed between \$5,000 and \$70,000 per occurrence.
- Jail time can also be involved with certain violations.

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Examples of non-serious violations include failure to provide employee training, blocked aisle ways and walkways, use of extension cords in lieu of permanent wiring, and most of all, not having a written injury and illness prevention program (IIPP). Serious violations are conditions that may cause serious  
(Continued on page 3, see AB1127)

## THE ENVIRONMENT AND US

The impact of industrial activities on the environment, and ultimately human health, is a pressing concern for the society at large. As a biomedical institution we use a variety of hazardous agents in our daily clinical and research activities. Although the quantities of the materials used is low, UCSF has implemented a number of comprehensive ongoing programs for ensuring employee health and safety. These programs have been in place for many years and have won the UCSF Office of Environmental Health and Safety a number of awards and certificates of achievement. In addition to our efforts in ensuring the health and safety of our employees, we have also implemented a number of programs to reduce the impact of our activities on the environment.

Since 1997, with the help of the EH&S User Committee and Campus Community at large, we have implemented a number of programs to reduce the hazards, and significant changes have occurred in radioactive waste volumes produced by UCSF laboratories. These include:

- A 20% reduction in the volume of low level radioactive (LLRW) waste.
- A reduction in the volume of mixed radioactive biological waste by 60%.
- A comprehensive LLRW management program to decay short half-life waste and reduce the waste being disposed.
- About 60% of the chemical waste generated at UCSF is being recycled.

(Continued on page 2, see Environment)

**(Mercury, continued)**

Fish and Game on the amount and species of fish one should consume. Methylmercury is rapidly and nearly completely absorbed from the gastrointestinal tract. On the other hand, the metallic form is poorly absorbed by the digestive tract, but 80% of mercury vapor is absorbed in the alveoli in the lungs.

Depending on the dose and length of exposure, mercury can cause symptoms ranging from irritation to skin, bronchitis, gingivitis, increased irritability, muscular tremors, irreversible brain damage, and many other symptoms.

**DHS PROJECT**

The California Department of Health Services (DHS) has obtained a grant from EPA and has selected UCSF to participate in a pilot waste reduction project along with a few other organizations. One of the targeted wastes that we would like to eliminate or minimize the use of is mercury. Robert Hunn, Safety Officer for the Medical Center, has agreed to work with EH&S and DHS to make the Hospital as mercury free as possible. DHS has completed a mercury assessment of the Clinical Laboratory on Parnassus and a report is forthcoming.

With this baseline data, the next step is to determine which pieces of equipment have the highest mercury content and develop a plan to replace them with non-mercury containing equipment. EH&S is conducting a similar assessment to reduce mercury in campus laboratories.

**UNIVERSAL WASTE RULE**

On March 7, 2000, the Department of Toxic Substance Control, California Environmental Protection Agency, issued Emergency Regulations for Universal

Waste Rule. An Emergency Regulation is only effective for a limited amount of time and then the issuing agency must go through the normal rule-making process, including public hearing, to replace the emergency regulation with a permanent regulation. This Rule defines certain wastes as Universal Wastes if they are lower risk hazardous wastes.

Specifically, Cal/EPA designated the following wastes as Universal Waste:

- Thermostats that contain small glass capsules of mercury
- Batteries including mercury, rechargeable nickel-cadmium, silver button, small seal lead-acid, most alkaline, carbon-zinc batteries, and other batteries which exhibit the characteristic of hazardous waste.
- Lamps including fluorescent tubes, high intensity discharge lamps, sodium vapor lamps, and other lamps which exhibit a characteristic of a hazardous waste. (These lamps contain mercury).

EH&S in cooperation with Facilities Management and other departments will ensure compliance with this Emergency Regulation, and by doing so, minimize the disposal of mercury into the environment.

*If you replace your mercury thermometer, you reduce your exposure to mercury vapors from breakage of mercury thermometers.*

You can make a difference by helping EH&S reduce mercury on campus. As a start, collect mercury-containing devices such as mercury oxide and button batteries, ultraviolet and high pressure sodium lamps, thermometers, barometers and relay, tilt or silent switches. Substitute chemicals containing mercury such as Zenker's solution, histological fixatives, staining solution and preservatives with other non-mercury containing solutions and fixatives. If you replace your mercury thermometer, you reduce your exposure to mercury vapors from breakage of mercury thermometers.

If you do have a mercury spill from a thermometer, call EH&S to send the emergency responder for proper clean up. Small droplets of mercury which are difficult to see and remove, are collected by EH&S with special vacuum cleaners designed for this purpose.

Please call EH&S for mercury waste collection. Thank you for your cooperation with our UCSF mercury reduction campaign.

**(Environment, continued)**

- Overall reduction in the total quantity of chemicals on hand.
- A comprehensive chemical inventory program to manage the chemicals on campus.
- A recycling program for used batteries.

We are also working on new programs to:

- Replace mercury thermometers and sphygmomanometers.
- Reduce mercury compounds on campus.
- Reduce the volume of medical waste.

As indicated, these reductions and changes have been possible with the help of the UCSF community. We encourage everyone to join us in our efforts to reduce our impact on the environment by:

- Purchasing smallest quantity of chemicals possible.
- Avoid disposal through the sanitary sewer.
- Replace hazardous chemicals with less hazardous ones when possible.
- Cap all containers when not in use.
- Use the smallest quantity possible for your experiments.



*The EH&S Safety Update Newsletter is distributed by the UCSF Office of Environmental Health and Safety. Please send comments to EH&S Safety Update Newsletter: Box # 0942 476-1300 editor@ehs.ucsf.edu*

# SAFE SHARPS FOR RESEARCH LABS

Research labs at UCSF that work with or handle human source material (blood and blood components, cells, unfixed tissues, etc.), cell cultures or cell lines of human origin, or animals inoculated with human source material or cell cultures must meet the requirements of the Cal/OSHA Bloodborne Pathogens Standard (8 CCR 5193) and the UCSF Bloodborne Pathogens Health Surveillance Program. In July of 1999, Cal/OSHA revised the Standard to require adoption of safe sharps (sharps with engineered sharps injury protection, or ESIP, features) whenever possible for any procedure with a risk of exposure to materials that may contain bloodborne pathogens. Research laboratories are not exempt from this requirement. Because the use of sharps in the research context is often unique, individual investigators must themselves decide whether there is a safe sharp alternative for each of their relevant procedures and, whenever possible, switch to using only the safe sharp for that procedure.

The hypodermic syringe/needle is one of the most common laboratory sharps. In some cases, syringes and needles are used for purposes for which they were not intended, such as simple volumetric transfer and suspension of a centrifugation pellet by shear mechanics. In these cases, the simplest safe alternative is to eliminate use of the needle, by performing the procedure with a pipette or pipettor and by using a cannula or length of tubing instead of a needle, respectively.

In those instances where the sharp needle is required, there are ESIP alternatives that must be considered. Some of these are quite simple in design and operation and can replace standard syringe/needle combinations in a wide range of routine lab tasks. Becton Dickinson and Monoject have made syringes for years that include a sheath that can be extended after syringe use and locked into place, completely covering the needle and rendering the device "safe". A more recent product, called *Needle-Pro* and made by Sims-Portex and Terumo, consists of a stan-

dard hub that fits between virtually any syringe and needle. The hub is provided with a hinged guard that can be swung up to engage and cover the needle completely. These two simple devices offer some of the greatest flexibility of any currently available and are easily applied to lab uses at minimal added cost. The Bloodborne Pathogens Standard does not consider cost as a valid reason for rejecting available safe sharps technology.

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Remember these safety points when using sharps in the lab:

- The activation of the ESIP feature is done when use of the sharp is finished. It renders the sharp safe only from then until discard. The only way to be safe prior to ESIP feature activation is to exercise good sharps handling practices. As always, the responsibility for safety falls directly onto the shoulders of the individual operator.
- The Standard states that "... containers for contaminated sharps shall be easily accessible to personnel and located as close as is feasible to the immediate area where sharps are used ...." Place the sharps waste container within an arm's length of the point of use of the sharp. That way,

the high-hazard time between end of use and discard of the sharp, and the risks associated with this period, are minimized. Then eliminate the residual risk entirely by activating the ESIP feature.

- Sharps made safe by ESIP features are still considered sharps waste and should always be discarded into appropriate sharps waste containers as soon after use as possible.

For information about the types and availability of sharps with ESIP features, visit the new SHARPS Injury Control Program web site at <http://www.ohb.org/sharps.htm> and click on the Safety-Enhanced Device Database link. For general information about the Bloodborne Pathogens Standard, visit the new Cal-OSHA FAQ site at <http://www.dir.ca.gov/DOSH/BloodborneFAQ.html>.

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**(AB1127, continued)**

employee injury or death. Examples are exposed conductors in an electrical panel, fall hazards, chemical exposure above Cal/OSHA permissible limits, or asbestos exposure during construction projects.

Please be sure that you have a written updated IIPP in your department that is available to the employees. If a Cal/OSHA inspector shows up unannounced in your area, please call EH&S immediately to assist you with the inspection. If you have health and safety questions, please contact your Departmental Safety Advisor (DSA) or call EH&S at 476-1300 for assistance.

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**PLEASE HAVE ALL PERSONNEL IN YOUR LAB INITIAL HERE AS EVIDENCE OF CONTINUING EDUCATION AND KEEP THIS NEWSLETTER IN YOUR LOGBOOK.**  
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**WHEN YOU HAVE FINISHED READING THIS NEWSLETTER, PLEASE PASS IT ALONG TO OTHERS IN YOUR LABORATORY OR OFFICE.**

- In this issue:
- Mercury
  - New Safety Legislation
  - The Environment and Us
  - Safe Sharps for Research Labs
  - Material Safety Data Sheets
  - EH&S Web Site & Publications to be Updated
  - New Waste Disposal Poster

*Environmental Health and Safety #717  
50 Medical Center Way  
San Francisco, California 94143*

### **MATERIAL SAFETY DATA SHEETS**

UC San Francisco, in collaboration with the University of California Office of the President, has developed a comprehensive database of Material Safety Data Sheets (MSDSs) that is available online for convenient access and use. The new database is appropriately called ChemQuik.

To obtain information online regarding an MSDS, simply log on to the EH&S web site, select MSDS from the left side of the home page, and select the link for ChemQuik - it is the first item on the EH&S list of MSDS related links.

### **EH&S WEB SITE & PUBLICATIONS TO BE UPDATED**

EH&S will soon be updating the departmental web site.

We would like your opinions and thoughts as to subjects you would like added to the site, as well as those which you reference infrequently and think would be better utilized with other information.

We will note all suggestions and try to incorporate as many as feasible.



The EH&S Guide for Laboratory Employees publication is also being revised and will be released to the campus community shortly.

### **NEW WASTE DISPOSAL POSTER**

EH&S is happy to announce the creation of a new Waste Disposal Poster. This poster will be an invaluable aid in determining the appropriate disposal streams for waste generated on the Parnassus Campus. The poster, color-coded for quick and easy reference, will be delivered to you by your DSA and will be posted on campus in various locations.

The new poster addresses the following:

- Radioactive Waste
- Hazardous Chemical Waste
- Medical Waste
- Non-hazardous Liquid Waste
- Non-hazardous Solid Waste
- Mixed Waste
- Controlled Substances Waste