

# Orthopaedic Research Laboratory



## LAB ORIENTATION MANUAL

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# BASIC LABORATORY SAFETY RULES

- **NO EATING OR DRINKING IS ALLOWED IN THE LAB AREAS**
- **NO OPEN TOE OR OPEN HEEL SHOES ARE ALLOWED IN THE LAB AREAS**
- **PROTECTIVE GLOVES AND APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT ARE REQUIRED WHEN HANDLING SPECIMENS AND CHEMICALS**
- **NO GLOVES ARE ALLOWED IN THE ADMINISTRATIVE AREAS**

# BASIC PRINCIPLES OF LABORATORY SAFETY

- **Know your procedure**
- **Know your chemicals**
- **Reduce exposure potential**
  - Substitute less hazardous materials
  - Use smaller quantities
  - Use a fume hood when needed
  - Reduce splash hazard
- **Wear protective equipment**
- **Use common sense**

# Student/Employees

Students who are also employees will be subject to the same risk assessment and enrollment criteria as other employees. Some students, by virtue of volunteering in laboratories, participating in 199 classes, or conducting individual research projects, may be exposed to increased risk equal to that of employees. Such students will be required to enroll in the Occupational Health Program. In all cases, the decision to enroll or not to enroll will be based on risk assessment of the work rather than on the employment status of the worker.

A major health and safety concern in this lab is protection while working with human/animal tissues. Therefore, nitrile gloves, lab coats or surgical gowns, masks and shoe covers are provided for your use and are located in Room 2106. Please use these safety precautions when handling specimens.

**WHENEVER YOU SUSTAIN AN INJURY, REPORT IT USING THE ACCIDENT REPORT ONLINE AT:**

**<http://safetyservices.ucdavis.edu/programs-and-services/injury-illness-prevention-iipp/injury-illness-prevention-program-iipp-1>**

# EH&S classes

The UC Davis EH&S website <http://safetyservices.ucdavis.edu/> or the UCDMC EH&S website <http://www.ucdmc.ucdavis.edu/medresearch/medsp/labsafety.html> are the primary resources for safety information

You can find and enroll in most all classes through the EH&S website <http://safetyservices.ucdavis.edu/training/environmental-health-safety-and-emergency-management-training>

## **ANIMAL CARE & USE 101**

Learn about the laws and regulations relating to the use and care of animals in research and teaching. Since the USDA requires that anyone working with animals be familiar with the regulations covering their use, attendance to this seminar is required by anyone working with animals in a teaching or research capacity. To enroll in this course and to view posted schedules go to Learning Systems Website listed above.

## **LABORATORY ANIMAL SKILLS**

The Office of the Campus Veterinarian regularly offers Laboratory Animal Skills classes. The classes cover husbandry, handling, restraint, injection and bleeding techniques of the various species of laboratory animals including mice, rodents and rabbits. Most of these classes are open to any interested animal care staff or student workers and are free of charge to UC Davis employees. You must attend the Animal Care and Use 101 class listed above before you can sign up for Lab Animal Skills classes.

## **BIOLOGICAL SAFETY & MEDICAL WASTE MANAGEMENT**

This course is required for anyone who handles human blood or body fluids or who generates medical waste.

# More EH&S classes

## **CHEMICAL/LABORATORY SAFETY**

This class satisfies initial awareness training specified by the laboratory safety standard for personnel working in laboratories that use chemicals. This class is also appropriate for workers new to chemical laboratory work and as a refresher for those who are returning to laboratory work or who want to brush up their skills.

## **HAZARDOUS WASTE MANAGEMENT AND MINIMIZATION**

This class is required for anyone who will be using chemicals or generating hazardous or chemical waste.

## **ANALYTICAL X-RAY SAFETY**

This class is specifically tailored for people who will work with analytical X-ray units (faxitron cabinets). Completion of this class, along with the online Diagnostic X-Ray Safety class is required in order to be added to lab MUA and to be able to receive lab training to operate X-Ray machines in the lab.

## **LABORATORY RADIATION SAFETY**

This class discusses sources of ionizing, radiation exposure limits, risk evaluation and safety precautions. Demonstrations of good health physics practices are stressed. This class is required for anyone using radioactive isotopes in the lab. Completion of this class along is required to be added to the lab RUA and receive training in radioactive isotope use.



# FIRE PLAN Intro

The Fire plan is to be used by the staff of SOM Research I to protect themselves and visitors from fire emergencies. It is part of a larger disaster plan for the Medical Center, which addresses all perils that could befall the facility.

The SOM Research I Fire plan consists of two essential elements, both of which must be present for it to succeed:

1. Written guidelines and posted information -

The plan contains general information applicable to the building, as well as specific guidelines and a floor plan for the building. Fire evacuation signs are designed to complement the plan.

Familiarization -

Being familiar with the locations of doors and windows and how they unlock is essential to the success of this plan. Know where the doors are...know how the locking mechanisms work. You should be able to find an exit in the dark!

# FIRE PLAN

If a fire occurs, you should know the R.A.C.E. procedure:

This consists of Rescue, Alarm, Confine, Extinguish

**RESCUE**: Rescue anyone (this includes yourself) who is in immediate danger from the fire. Remove these people to the closest safe area, simultaneously notifying other staff of the fire and its location. Know where the alternate exits are located.

**ALARM**: If you are the first person to discover a fire, alert the people in the area so that you can take proper action together. Immediately pull a fire alarm manual pull station and call 9-1-1 from the nearest safe location. If you are involved in a rescue, send someone to pull a manual fire alarm pull station and call 9-1-1.

**CONFINE** : Confine the fire by closing all of the doors in and around the fire area. This will keep fire and smoke out of the exit way during evacuation. The doors are programmed to automatically shut and lock when the alarm goes off. Please do not try to get back into the rooms when they are closed.

**EXTINGUISH**: There is no better time to control and extinguish a fire than in its early stage. Utilize fire extinguishers if you discover a fire in its earliest stage. If a fire is well developed, however, the best thing to do is to get out safely. Do not place yourself at unnecessary risk.



# FIRE PLAN EVACUATION

If a fire occurs, all personnel will evacuate the building immediately. Use the nearest safe exit. **Do not use the elevator.** Staff using the rear (east) exit should be alert for vehicular traffic, particularly fire vehicles using the driveway to access fire hydrants and fire sprinkler connections. After evacuation, everyone will assemble in the parking lot in the front (west side) of the building.

◆ *Account for all employees and report to Matthew Anderson or Blaine Christiansen. Missing persons should be reported to responding emergency personnel.*

# FIRE PROTECTION COMPONENTS

Building 97 has been designed with specific features that will impede the spread of fire. It is important that you understand these features so that you (1) effectively use these fire protection components during an actual fire, and (2) don't inadvertently neutralize or override the components as you carry out your daily duties.

## Building construction and related passive fire protection features

This building is constructed of noncombustible structural materials, principally concrete and steel. Each floor is constructed with fire-rated (fire resistant) walls, floors and corridors in such a way that the building is compartmentalized. This is the passive method of fire protection designed to keep the fire from spreading throughout the building.

## Fire sprinkler systems

Fire sprinklers are designed to open when exposed to heat (not smoke) from a nearby fire. These systems are the most effective means of stopping a fire from spreading throughout a building. The Research Laboratory is protected by an automatic sprinkler fire system with sprinkler heads in every room.

## Fire alarm system

There is a complete fire alarm system in this building. Pull the fire alarm manual pull station and dial 911 to report any fire, even if the fire is immediately contained. Dial 911 from a safe location, and do so as soon as possible. There are pull stations at the end of each exit corridor. If you use a pull station, be sure that you or someone else calls 911 as well.

## Fire extinguishers

Class ABC fire extinguishers are provided in the building for your use. Class ABC fire extinguishers are for use on fires involving ordinary combustible materials (wood, paper, plastic and textiles), flammable liquids, and energized electrical equipment. Be sure that you know where the fire extinguishers are located and how to operate them.

# If you are injured in the lab

If you sustain an injury/illness while working in the lab, **REPORT** the incident **IMMEDIATELY** to your supervisor.

The supervisor will arrange for you to get appropriate medical care or provide first aid treatment.

Even if the injury seems minor, it should be reported. There is a injury report form in each lab area. The slightest cut with a scalpel or even a paper cut should be reported.

An employee claim form **MUST** be provided to the employee within **ONE** working day if the injury/illness results in:

- \*medical treatment beyond first aid,
- \*lost time beyond the day of injury,
- \*the request of an Employee Claim Form.

**As is required by law, your supervisor will give you the Employee Claim Form. If there are questions, the Workers Comp can be contacted at 734-6180.**

# FIRST AID: Electrical Burns

1. Make sure that the electrical power is turned off before attempting to assist the victim.
2. Remove the victim from any potential threat of fire.
3. If the victim is pulse less, CALL 911!  
CPR SHOULD BE ADMINISTERED
4. If the victim has signs of life, conscious or unconscious, place victim in shock position (feet elevated above heart) and seek prompt medical attention.

Most damage from electrical burns is internal and should be treated at the hospital.



# FIRST AID: Chemical Burns

Chemical burns of the skin and eyes are caused by caustic chemicals such as strong acids, alkalis and other caustic agents.

## **Skin**

- 1. Remove any contaminated clothing from the burn area.**
- 2. Flush affected area with copious amounts of water at least 15 minutes. If a large body surface area is affected, use the emergency shower located in the hallway.**

**If burns are caused by strong acid, neutralize with bicarbonate of soda.**

**If burns are caused by dry lime, brush off powder and flush with phenol.**

**DO NOT USE WATER IN THESE CASES!**

- 3. Cover the affected area with a dry sterile dressing.**
- 4. Observe for signs of shock and seek medical help.**

## **Eyes**

- 1. Flush the eye(s) with eyelids open for a minimum of 20 minutes with large volumes of water. Eyewash stations are in each hallway. Use them!**
- 2. Bandage the affected eye with a moist, sterile dressing, then cover both eyes.**
- 3. Observe for signs of shock and seek medical help.**

**IN ALL CASES, TRY TO IDENTIFY THE CHEMICAL INVOLVED,  
BUT ONLY AFTER VICTIM HAS BEEN TREATED!!!!**



# FIRST AID: Thermal Burns

**Thermal Burns:** Burns of the skin and/or eyes caused by heat, fire or explosion.

1) Remove victim from the source of the heat and observe the type of burn involved:

- a) 1st degree = skin reddened
- b) 2nd degree = skin reddened with blister formation
- c) 3rd degree = skin is charred

2) 1st degree - Rinse with cool water.

2nd degree and 3rd degree - Cool with sterile water or saline while covered with a sterile sheet or towel. Remove clothing from around the burn site, but not clothing that has been burned into the site. Do not use any kind of ointment on the burn and do not rupture any blisters.

**Treat for shock for 2nd and 3rd degree burns.**

**Call 911!**

# FIRST AID: Poisoning

## Inhalation Poisoning

- 1) Remove the victim from the source of the chemical.
- 2) Observe the victim for spontaneous respiration. If none is observed, have someone call **911** for medical assistance and start artificial respiration:
  - a) Tilt victim's head back to open airway.
  - b) Look and listen for respiration. If none continue.
  - c) Pinch nostrils closed and breath four full breaths of air into the victim's mouth. Observe for respiration.
  - d) Breath into the victim's mouth once every 5 seconds until the victim breaths spontaneously or until medical assistance arrives.
- 3) When the victim is breathing spontaneously, insure adequate ventilation with oxygen or fresh air.

## Ingestion Poisoning

- 1) Look for any identification of the chemical involved and read the label for any specific antidote (check **Material Safety Data Sheets**). Have someone call the **POISON CONTROL CENTER AT 9-1-800-876-4766 or call 911!**
- 2) Note if the victim is conscious or unconscious. If unconscious then start artificial respiration and/or CPR.

General rule - Induce vomiting ASAP by using the gag reflex and/or administering some type of emetic such as Syrup of Ipecac or Saltwater. Exceptions are when the victim has acid or caustic burns around their mouth or has a petroleum breath odor. In these cases **DO NOT INDUCE VOMITING - DILUTE WITH WATER OR MILK!** Do not attempt to neutralize unless specified by the poison control center.

# FIRST AID: Eye Injuries

**May be caused by shrapnel from milling, grinding or drilling equipment.**

- 1) Pull upper eyelid down over the eye to the lower eyelid to dislodge any particle from the cornea. Repeat if necessary. If the object can be seen, it may be able to be removed by using a piece of tissue paper.
- 2) If this doesn't work, try washing out the eye with saline or water from one of the many eyewash stations in the lab.
- 3) If this still doesn't work, bandage both eyes and have the patient transported to the hospital emergency room for a more thorough examination.
- 4) If an object has been impaled into the orbit, seek medical attention at once. **Call 911!** Do not attempt to remove the impaled object. Bandage both eyes and treat for shock.

# Miscellaneous Injuries

## **Bleeding**

1) Control hemorrhage from injuries such as deep cuts and avulsions by applying direct pressure to the injury site with any type of absorbent cloth material.

**If the bleeding is severe call 911 !**

2) Continue to apply fresh cloth or gauze as needed to control the hemorrhaging without removing any previously applied material. Be sure to evaluate the injury site if possible.

3) If direct pressure and elevation above the heart doesn't control the bleeding, apply pressure to the pressure point proximal to the injury site. Apply a tourniquet only as a last resort and only when a decision between life or limb exists.

4) Place the victim in shock position with their legs elevated above their heart and kept warm.

5) In the case of amputation, a tourniquet may be required. Additionally, place any avulsed pieces/parts in saline in a freezer bag and label it for material testing or transport to the hospital with the victim.

# Miscellaneous Injuries

## Heart Attacks and Strokes

- 1) Seek medical attention at once.

**Call 911 !**

- 2) Start CPR.
- 3) In the case of a stroke, insure that the victim has an adequate airway. Keep the victim calm and treat for shock.



# Miscellaneous Injuries

## **Shock**

- 1) Signs of shock are:
  - a) Pale with cool and clammy skin.
  - b) Varying degrees of sweating.
  - c) An increased respiration rate as the blood pressure drops and the pulse rises.

### **CALL 911**

- 2) Place the victim lying down on their back with their legs and feet raised 6-8 inches above the ground.
- 3) Place a blanket over the victim to keep them warm. Also place a blanket under them to decrease the conduction heat loss into the ground.
- 4) Do not give anything by mouth to a person with a severe abdominal injury, or to a person who has no gag reflex or to an unconscious person.

# Human Tissue Handling

Speak to Safety Coordinator about precautions and equipment before commencing work for the first time.

- 2) Always wear gloves, protective clothing and face mask. Remove your gloves before touching anything other than your contaminated tools or specimens. Remove them before answering the phone, opening the door, operating a computer keyboard, opening a drawer, turning on a light, etc., etc. If you use a pen or pencil with contaminated gloves on, it must be decontaminated; it is expensive to dispose of contaminated waste and it can not be left as a hazard for other workers.
- 3) Hepatitis B Vaccination is required. Talk to the Lab Coordinator about getting the vaccination series.
- 4) All Tissue that is brought into this lab has been screened and test non-reactive for Hepatitis and HIV. However, treat all human tissue as though it contains a transmissible virus.
- 5) Dispose of all human tissue into the waste freezer, rm. 2210 with ID tag.
- 6) Dispose of all paper and dirty gloves into one of the red biological waste cans.
- 7) Dispose of any sharp objects into a Sharps container (located in every room). Dispose of the Sharps container when it is 2/3 full by sealing it, writing the date and room number on it then place it in a red biological waste can.

# Specimen Exposure

Students whose only exposure to animals or cadaveric specimens will be participation in a teaching exercise will not normally be required to enroll in the Occupational Health Program, but they should be provided with information about any health considerations relative to the specimen with which they will be working.

**All specimens received by ORL test non-reactive for HIV, Hepatitis B and C.** However, treat all human tissue as if it contains a transmissible virus.

Always wear gloves and a gown or lab coat when handling cadaveric specimens.

All specimens must be placed in a **secondary container** when transporting them.

Make sure specimen is identified with an ID tag at all times containing the following info:

**Specimen ID# assigned by donated body program**

**Name of Principle Investigator**

**Description of specimen including species -ex. human rt. lower limb**

**Date last used**

**THERE IS ABSOLUTELY NO HUMAN TISSUE ALLOWED IN THE WASTE CANS!**

Dispose of all human tissue into the waste freezer (Rm 2210) and mark “waste” on tag

Dispose of all paper and soiled gloves into Red Biological Waste cans.

Dispose of any sharp object into sharps container (in every room).

Dispose of Sharps container when 2/3 full into Red Biohazard Waste container.

**DO NOT REMOVE TISSUE FROM ORL. PERIOD!**

# Disposal of Cadaveric Waste

## **CADAVERIC SPECIMENS**

Cadaveric waste is classed with blood borne pathogen waste material. Place cadaveric waste in a plastic bags with ID tag. Write date / specimen ID # and description / PI name / and "waste" on tag. Place in Human Waste Freezer (Rm. 2210). When freezer is full, the mortuary service will be contacted.

## **BLOOD AND BODY FLUIDS**

**Non-infectious blood and body fluids in tubes, bags, vacutainers, etc.**

Treat with bleach (10% final volume) and pour into a sink drain connected to the campus sewage system. **DO NOT** pour into a storm drain. **DO NOT** dispose of containers of liquids in garbage cans, dumpsters or red biohazard cans.

**Non-infectious blood or fluid soaked materials**

Place bandages, gauze, paper towels, etc. in the red biohazard bags. **There should be no dripping or leakage of liquid from bagged waste.**



# Needle and Sharps Disposal

Sharps waste is composed of instruments used to puncture, cut, or scrape body parts, that when disposed of can cause punctures or cuts. **DO NOT** throw sharps containers or sharps directly into garbage cans or dumpsters.

## **NEEDLES AND SYRINGES**

### **Containing nonhazardous substances**

Place into a hardwalled sharps container (non-red without biohazard label). When 2/3 full, seal the container, mark it with the date and room number and place the sharps container in red biohazard trash bin.

### **Containing biohazardous materials (blood etc)**

Place into a hardwalled sharps container (red with biohazard label). When 2/3 full, seal the container, mark it with the date and room number and place the sharps container in red biohazard trash bin.

### **Containing chemical carcinogens**

Place into a hardwalled sharps container. Label with a hazardous waste label, and contact EH&S for pick-up as a hazardous chemical waste (4-7324).

### **Containing radioactive materials**

Place into a hardwalled sharps container (non-red without biohazard label). Label with radioactive tape, and place full sealed container in a dry radioactive waste box. Contact EH&S for pick-up as radioactive waste (4-3355).



# GLASS DISPOSAL

## **LABORATORY GLASS**

Any item that could puncture regular waste bags and endanger waste handlers. DO NOT pick up broken glass with your hands, if possible. Wear cut-resistance gloves and use a broom. Collect broken glass as carefully and completely as possible.

### **Contaminated with nonhazardous substances**

Place clean glass and triple rinsed glass bottles into the lined cardboard glass container or glass waste can in rm 2110.

Custodial staff will dispose as nonhazardous waste. Call Env. Svcs 4-2855 for pickup.

### **Contaminated with biohazardous agent (blood etc)**

Place into a hardwalled sharps container (red with biohazard label). Seal and label with room number and building and place in red biohazard can.

### **Contaminated with toxic or hazardous chemicals**

Place into a hardwalled sharps container (non-red without biohazard label). Label with a hazardous waste label, and contact EH&S for pick-up as a hazardous chemical waste.

### **Contaminated with radioactive waste**

Place into a hardwalled sharps container (non-red without biohazard label). Label with radioactive tape, and place full sealed container in a dry radioactive waste box.

Contact EH&S for pick-up as radioactive waste.

# General Chemical Safety

Proper chemical storage is essential in assuring a safe work environment for students, staff, faculty, and visitors. These guidelines will help you store chemicals safely in your work place.

## Inventory

Federal, state and local regulations require that the campus maintain chemical inventories. ORL does an internal audit of all chemicals every year, so please keep track of the chemicals if you order them.

## Labeling

All chemical containers must be clearly labeled. These labels should include the chemical name, chemical manufacturer, major hazard(s), and date received and/or prepared.

## Storage

Chemicals should be stored according to compatibility and hazard classification. Storage areas must be clearly labeled. Laboratories must establish separate storage areas for each of the following:

- Flammable and combustible organic solvents.

- Corrosive inorganic acids.

- Dry poisons, dry salts and dry oxidizers.

- Corrosive bases.

- Corrosive organic acids such as acetic acid.

**CHECK YOUR LAB AREA FOR THE STORAGE  
LOCATION OF CHEMICALS!!!**

# Chemical Safety Guidelines

– Know the location of all Eyewash/  
Shower stations and fire extinguishers:

– Eyewash/Shower Locations

- Hall alcove outside Rm. 2101
- Hallway outside Rm. 2108
- Room 2206
- Hall outside 2212

Fire Extinguisher Locations (in Hall)

Room 2002

Room 2111

Room 2202

# CHEMICAL SAFETY/ MSDS

Locations: Material Safety Data Sheets are located in each laboratory area where chemicals are stored. You are responsible to know the chemicals you are working with. All MSDS are available online.

Locations:

Room 2107- Above the sink (3 binders)

Room 2109- Histology Desk

Room 2208- Bookshelf above desk

Room 2204 (Electronics Room)- Bookshelf above bench

If you intend to work with a specific chemical, read the MSDS. Knowing the properties of your chemicals will make a safer environment.

For more information about safety, access the Environmental Health and Safety website. [http://ehs.ucdavis.edu/chem/chem\\_links.cfm](http://ehs.ucdavis.edu/chem/chem_links.cfm) or <http://www.tomescps.com/Disclaimer.asp> for chemical lookup.

# Disposal of Chemical Waste

All hazardous chemical waste must be picked up by Environmental Health and Safety (EH&S) technicians (4-7324)

Empty chemical containers may be disposed of as ordinary laboratory trash if the chemical is not classified as an extremely hazardous material, each container is triple-rinsed, allowed to air dry, all labels are defaced, and the cap removed. Custodians are instructed not to dispose of any chemical bottles unless the bottles have been properly cleaned. **At no time should full, partially full, or unrinsed containers be thrown in the trash.**

Empty extremely hazardous materials containers should not be triple-rinsed. These must be disposed of as hazardous waste.

All sharp objects such as needles, syringes, and broken glassware must be placed in a hard-walled container and labeled with the hazardous waste label. All fluorescent, metal halide and mercury vapor bulbs are considered hazardous waste and must be disposed of properly. Please contact Facilities Services at 4-7324 to arrange pickup of your used light bulbs.

The form used for chemical waste disposal is located in Room 2208.



# FORMALIN USE

Formaldehyde is a colorless, flammable gas with a strong pungent odor that can be detected at less than 0.5 parts per million (ppm). The aqueous solution formalin is 37-40 percent formaldehyde. Common uses of formalin and formaldehyde include tissue fixing and preservation, disinfection, and fumigation. Formaldehyde is a suspected human carcinogen. Exposure to formaldehyde vapors can be irritating to the eyes, nose, and upper respiratory tract. In certain individuals, repeated skin exposure to the liquid can cause sensitization that may result in allergic dermatitis.

Cal/OSHA has adopted an airborne formaldehyde permissible exposure limit (PEL) of 0.75 ppm averaged over an 8-hour work shift. The agency has also established a short-term exposure limit (STEL) of 2 ppm over a 15 minute period. The American Conference of Governmental Industrial Hygienists (ACGIH) has established a more restrictive Threshold Limit Value-Ceiling (TLV-C) for formaldehyde of 0.3 ppm based on its sensory irritation properties.

If you use or store formaldehyde (or formalin) you need a Carcinogen Use Authorization. Application packets are available from EH&S at 752-3732. Application forms are also available on the EH&S web site or in the Chemical Carcinogen Safety Manual.

## Minimizing Exposure To Formaldehyde For Health Protection

**ALL WORK** with formalin must be done in a chemical fume hood. If work cannot be done in a hood, contact EH&S to take air measurements assuring that exposures are below Cal/OSHA's 0.5 ppm action level and 2 ppm STEL. EH&S will make additional recommendations based on sampling results.

**WEAR PROTECTIVE CLOTHING.** Gloves must be worn whenever formalin or tissues preserved with and/or fixed with formalin are handled. Safety goggles or a face shield must be worn whenever work activities create a potential for splashing.

# Formaldehyde Precautions

## Special Safety Precautions

If Formaldehyde contacts the body, especially the eyes, flush the affected area with water for at least 15 minutes and report to Employee Health Services. Contact lenses must not be worn in areas where formalin is used because trapped vapors can cause irritation to the eyes. If contact lenses are required for medical reasons, contact

EH&S at 530-752-1493.

ALL SOLUTIONS of formalin and tissues preserved in formalin must be stored in tightly sealed containers to prevent leaks, spills, and airborne exposure.

**DO NOT pour formalin waste into laboratory sinks.** Formalin waste solutions must be placed in tightly sealed, labeled waste containers. For waste pickup call EH&S Occupational Safety at 734-7324 to submit waste disposal requests.

Small spills of dilute formalin solutions must be cleaned up immediately. Cover the spill with paper towels or other absorbent material. Do not mop up a spill. Using a dust pan, scoop the absorbed formalin into a plastic bag. Be sure to wear gloves and eye protection. Double bag, seal, and label the waste. Contact EH&S for pickup. Use bleach to neutralize the formalin on any contaminated surfaces afterwards.

CAUTION: If spilled formalin causes eye, nose, or throat irritation, immediately evacuate the area, close all doors to contain vapors, and call the UC Fire Department at 911.

Be prepared to give the location of the spill, approximate amount involved, your name, and phone number. Have someone wait for emergency response personnel outside the building and direct them to the spill area.

# Chemical Spill Control

General Steps to follow:

1. When 1 pint or more of a hazardous substance or any amount of an extremely toxic substance is spilled or when in doubt, call Fire Department (911). Evacuate the room, close the door, and wait for emergency personnel.
2. If the substance spilled is flammable, turn off all ignition sources before securing the room.
3. All contaminated clothing must be removed immediately. Clothes must be laundered before reuse or disposed of as hazardous waste.
4. In case of chemical contact with skin or eyes, flood the affected area immediately with water; continue for at least 15 minutes. Seek medical assistance at Employee Health Services or for skin irritation, contact with an extremely toxic substance, or any eye injury.
5. When incidental to one's duties, small spills (1 pint or less) may be cleaned up by laboratory personnel. It is good laboratory practice to keep spill absorbents on hand. Absorbent material is available in Room 2107, atop the yellow cabinets on the east side of the room.
  - a. Most strong acids may be absorbed and then neutralized with aqueous solutions of sodium bicarbonate, calcium hydroxide (slaked lime), or sodium carbonate (soda ash). (Note: DO NOT attempt to absorb hydrofluoric acid (HF). Skip this step and neutralize immediately only if you are familiar with proper neutralization procedures for HF; otherwise, return to step one.)
  - b. Caustic solutions and flammable liquids may be absorbed with an inert absorbent.
  - c. DO NOT attempt to blot cryogenic liquid spills with unprotected hands. Wear gloves. If the cryogenic fluid evaporates to a flammable or toxic gas, follow procedures (1) and (2) for large spills.
  - d. Formaldehyde spills may be absorbed with an inert absorbent. See online SafetyNet 11: "Guidelines for the Safe Use of Formaldehyde", for more information.
  - e. For mercury spills, see SafetyNet 16: "Guidelines for Mercury Spill Control", for more information.  
[http://www.ehs.ucdavis.edu/sftynet/sn\\_mlist\\_num.cfm](http://www.ehs.ucdavis.edu/sftynet/sn_mlist_num.cfm)
  - f. Solid spills are not usually emergencies. If the material spilled is toxic, use dampened cloths or paper towels to transfer it to plastic bags. Brushing dry material may cause dust to become airborne.
6. All absorbed spill material must be collected in double plastic bags or plastic containers with secure lids and disposed of as hazardous waste. Label the container with a hazardous waste label and call Ram Naidu (916) 734-7325. If the absorbent has been used for a flammable or volatile compound, it must be stored in a well-ventilated area away from sources of ignition while awaiting pickup. A fume hood is a good temporary storage area. Information on the proper procedures for handling, storage, and disposal of most common laboratory chemicals is available from EH&S at 734-7325.

# Solid Spills

Solid spills are not usually emergencies. If the material spilled is toxic, use dampened cloths or paper towels to transfer it to plastic bags. Brushing dry material may cause dust to become airborne.

1. All absorbed spill material must be collected in double plastic bags or plastic containers with secure lids and disposed of as hazardous waste. Label the container with a hazardous waste label and request a hazardous waste pickup at 4-7324. If the absorbent has been used for a flammable or volatile compound, it must be stored in a well-ventilated area away from sources of ignition while awaiting pickup. A fume hood is a good temporary storage area.

A general-purpose spill absorbent is available in Room 2208. Use it!



# Radiation Safety

## **YOU MUST BE CERTIFIED BEFORE USING ANY XRAY EQUIPMENT IN THE LAB**

- 1) Strict adherence to all radiation safety procedures as defined in the UCD Radiation Safety Manual (located in room 2107) is required.
- 2) A radiation safety course is required every three years if you are going to be using any radioisotopes or radiation producing machines.
- 3) Talk to the Lab Coordinator if you need to get certified for any radiation use.
- 4) Always wear your dosimetry badge when using any ionizing radiation producing machine or isotopes.
- 5) Always wear gloves and protective clothing when using radioactive isotopes.
- 6) Always wear lead apron and gloves if you are going to be located near a specimen that is being X-rayed.



# Radiation Waste Minimization

Use smaller (3 ml) scintillation vials instead of the larger (10 ml) vials.

Use radioisotopes with half lives less than 90 days.

Dry waste contaminated with short-lived radioisotopes is incorporated into the EH&S decay-in-storage program. This reduces the amount of waste at radioactive waste disposal sites. Separate short-lived radioisotopes (half-life less than 90 days) from long-lived radioisotopes in dry waste.

Separate organic, toxic, or corrosive solutions from aqueous nontoxic or noncorrosive solutions.

Do **not** put dry radioactive waste containers near regular trash containers. This will reduce the possibility that non radioactive waste will be inadvertently put into the radioactive waste container.

If applicable, carefully run a meter at a rate of two inches per second and one-half inch above the surface of potentially contaminated dry waste. If the surface dry waste is less than two times background, deface all radioactive symbols and put in regular trash container.

Aqueous solutions with pH between 2 and 5 or 9 and 12.5 should be **normalized** prior to placement in the approved Office of Environmental Health and Safety/UCDHS Health Physics waste jug.

# Disposal of Radioactive Waste

## Scintillation Vials

Separate scintillation vials with activities less than 0.05  $\mu\text{Ci/ml}$  of  $^3\text{H}$  or  $^{14}\text{C}$  from other scintillation vials.

If you buy vials in bulk and need empty flats or boxes, call Health Physics at 4-3355. Pack the vials in the original shipping boxes or strap up to five flats together. Avoid placing tape directly on the vials by using a cardboard or stiff paper cover or wrapping the flats in absorbent paper. Clearly identify the radionuclides and activities contained in each box on the Radioactive Waste Label.

Nonradioactive, environmentally safe scintillation cocktails may **NOT** be disposed of down sink drains. Call Health Physics at 4-3355 to request a waste pickup.

## Radioactive Waste Containing Biologicals

Double-bag biological waste in 4-mil, clear plastic bags for disposal. Seal the bags and attach a completed Radiation Waste label. Clearly identify the radionuclide, activity and weight (in pounds) contained in each bag. |

Biological waste bagged as biohazardous must be sterilized or autoclaved before disposal as radioactive waste.

Freeze the biological waste until pickup.

# Animal Projects

## Animal Project Requirements for Participants

Participants must do the following before working on an animal project:

- Complete Animal Care and Use 101
- Complete and submit Occupational Health forms
- Use the Hazard Analysis Tools from EH&S <http://ehs.ucdavis.edu/animal/risk/index.cfm>
- Have your name on or have it amended to the Animal Use Protocol
- Receive training on proper handling of the animal species used in the project
- Receive training on personal hygiene and the personal protective equipment to be used
- Receive training in Aseptic Technique and any special procedures related to the project
- Read and understand the procedures approved for the project in the Animal Use Protocol
- Receive instructions in proper completion and storage of Animal Surgery Logs
- Update Training Records
- “Everyone working on live vertebrate animals must be qualified, informed and trained.”
  - SafetyNet#116

# Things to Know About Animal Projects

- You can submit an Animal Use Protocol BEFORE you've taken the animal classes or have funding for the project. HOWEVER, training for everyone listed on the Protocol must be completed BEFORE the protocol is approved.
- IACUC normal turnaround time for Protocol approval is 6 to 8 weeks.
- All Animal Use Protocols need to be reviewed by Shane Curtiss before being submitted to IACUC.
- Copies of all Active Animal Use Protocols are kept in Room 2208 in the lab.
- You should call the Campus Vet for help whenever one of your animals is sick or you are having trouble or have questions about anesthesia, surgical techniques or post op care.
- Rodent Survival Surgery requires aseptic technique, sterile instruments for each animal and the surgical site must be clipped and scrubbed. Surgeons must wear a minimum of a mask, sterile gloves and a clean scrub shirt or lab coat.
- Nonsurvival Rodent Surgeries require a minimum of clean instruments, a clipped surgical site and the surgeon must wear gloves.
- Exposed sutures and staples must be removed from the incision site within 7 to 10 days.
- "Laboratory Study Areas" are rooms animals can be housed for up to 12 hours.

# Disposal of Animal Waste

## **Healthy animals not treated with chemicals, radioisotopes, or biohazardous agents**

Place animal parts, tissue, waste and carcasses (small and large animals) in tightly sealed plastic bags in the Dead Animal Waste freezer in the basement of Research 3. Carcasses will be sent off campus to a rendering company or incinerated.

## **Animals treated with chemical, radioactive, or biohazardous agents**

Contact EH&S (4-3355) to develop a written handling, transportation and treatment and/or disposal procedure.



# Specialized Equipment Use

**Talk to a staff member prior to using any equipment for the first time**

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## **Histology Lab**

Microtomes  
Embedding  
Diamond Saws  
Staining  
Blade Sharpening

## **Biochemistry Lab**

Balances  
Centrifuges  
Chemicals ( Acid, Base, Teratogen, etc.)  
Glassware use  
Ph Meter / Ion Meter  
Stir Plates/ Hot plates  
Fume Hoods

# Specialized Equipment Use

## **Tissue Culture Lab**

- Sterile procedures
- Glassware use
- Incubator operation
- Autoclave
- Microscope use
- Hemocytometer
- Centrifugation
- Cell Isolation
- Bio Hoods
- Media Preparation

## **Machine, Material Testing & Electronics Shops**

- Band saws
- Mills
- Lathe
- Drill press
- Hand Drills
- Tap & Dye Set
- Soldering
- Sanding
- Vacuum System
- Instron Machine & Computers

# Effective Use of Autoclaves

Steam sterilization of materials is a dependable procedure for the destruction of all forms of microbial life. They are common laboratory tools that must be properly used to be effective. This establishes guidelines for the effective use of steam sterilizers (autoclaves) for the decontamination of cultures and other potentially biohazardous materials.

Containers: Materials that are to be decontaminated should be carried to the autoclave in leak-proof containers.

Personnel should wear proper personal protective equipment, i.e. heat resistant gloves, eye protection and a lab coat, particularly when unloading the autoclave.

At the end of a decontamination cycle make sure that the pressure in the autoclave chamber is near zero before opening the door. Slowly crack open the autoclave door and allow the steam to gradually escape from within the autoclave.

# Machine Shop & Material Testing Safety

- 1) Get checked out by the biomechanics technician before using any equipment for the first time.
- 2) Always wear protective eyewear. Goggles or facemasks are acceptable, regular prescription eyeglasses are not. Don't wear loose clothing or jewelry when operating equipment.
- 3) You can not operate equipment alone in the lab, especially after hours or on holidays.
- 4) If you are working with human tissue refer to the above section on handling human tissue.
- 5) Use only the designated band saw and be sure to use the vacuum dust collection system when cutting bone.

# ORL Golden Rules

1. If you open it, close it.
2. If you turn it on, turn it off.
3. If you unlock it, lock it
4. If you break it, fix it.
5. If you can't fix it, find someone who can.
6. If you borrow it, return it.
7. If you use it, take care of it
8. If you make a mess, clean it up.
9. If you take it out or move it, put it back.
10. If it belongs to someone else and you want to use it, get permission



# If you have a question about...

|                     |                  |        |
|---------------------|------------------|--------|
| Personnel           | ask Kim Pierson  | 4-3311 |
| Accounts            | ask Jackie Dalke | 4-8650 |
| Ordering Supplies   | ask Jackie Dalke | 4-8650 |
| Safety              | ask M Anderson   | 4-5760 |
| Cadaveric Specimens | ask M Anderson   | 4-5760 |
| Animal Protocols    | ask M Anderson   | 4-5760 |
| X-rays              | ask M Anderson   | 4-5760 |
| Histology           | ask M Anderson   | 4-5760 |
| Materials Testing   | ask M Anderson   | 4-5760 |

# UCDHS CONFIDENTIALITY AGREEMENT

Information/Network Services  
Administration Support Building, Room 2600

Please complete this form and send to the Information/Network Services Office. If you have any problems or questions, call the Information/Network Services at 916 734-5361 or 734-5650. Fax: 916 734-7212

## AUTHORIZED USER OF COMPUTER EQUIPMENT AND PROGRAMS AT UCDHS

Employee Name (Please type or print) Last, First, Middle (if none write NMI - No Middle Initial)

Department

Start Date

Name of Direct Supervisor/Manager

Phone

SSN (last 6 digits of #) \_\_\_\_\_ or PPS (Employee ID#) \_\_\_\_\_

I acknowledge that I have received information emphasizing that I must preserve the confidentiality of all information regarding patients, personnel, health system finances, and all other aspects of health system operations. I understand I must not disclose my password to anyone.

Per UCDHS Policies and Procedures, Section 1309, Information Security and Access, all UCDHS employees who disclose their password, access or release data without proper authorization or authority may be subjected to disciplinary action, up to and including dismissal, or criminal action (if criminal intent is shown.). Depending on the severity and impact of an unauthorized release of information, UCDHS and the employee may be subject to an administrative fine, civil penalty, or lawsuit. It is, therefore, extremely important that each employee take the responsibilities for maintaining security of data and passwords seriously.

I agree not to share my password with any other individual or allow any other individual to use the system once I have accessed it. I understand that I may have my password changed at any time by the system administrator.

If I have reason to believe the confidentiality and security of my password have been compromised, I will report this information to the system administrator or my supervisor as soon as possible.

I have read and agree with the UCDHS Information Systems Security and Access Policy and I assume the responsibility for keeping my security code (password) secure and confidential and of not releasing information as described above.

UCDHS Policies and Procedures, as well as State and Federal regulations require that individuals may only access confidential patient information to the extent that they must do so in order to properly perform their clinical or administrative job function. Individuals are restricted to accessing only the minimum necessary information. Accessing confidential patient information for purposes unrelated to an individual's primary job function is a violation of UCDHS Policy and is subject to disciplinary action, up to and including termination.

EMPLOYEE SIGNATURE

DATE

# Orthopaedic Research lab

My signature indicates that I have read and understand the health and safety policies and procedures in the Orientation manual at SOM: Orthopaedic Research Laboratories. This form has also been signed by the administrator and the Principal Investigator.

Name- Print:

Sign: \_\_\_\_\_ Date: \_\_\_\_\_

Email:

Duties:

Principal Investigator:

Administrator:

Turn in this completed form to Lab Coordinator.