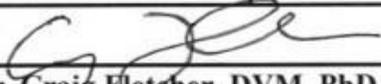




DIVISION OF LABORATORY ANIMAL MEDICINE STANDARD OPERATING PROCEDURE

Handling Cages Dosed with Chemical Hazards

DIVISION OF LABORATORY ANIMAL MEDICINE (DLAM)	ORIGINATION DATE: 05-19-11
SOP #:	DATE LAST REVISED: 12-13-16
	
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Purpose and Responsibility

Chemicals that are toxic, known or suspect carcinogens, reproductive hazards, teratogens, mutagens and antineoplastic agents may be used in animal protocols. All chemicals being used must be documented in an Institutional Animal Care and Use Committee approved protocol. It is the responsibility of the Principal Investigator to evaluate potential exposure risks of hazardous chemicals and drugs to lab and animal husbandry staff during:

- Chemical preparation
- Animal dosing
- Husbandry activities, including cage changing and disposal of bedding

This SOP is meant to address procedures that will be used to protect animals not under the approved chemical protocol that are housed in the same building/room/rack, humans and/or the environment from potential exposure to chemical hazards.

For guidance on what chemicals are covered by this SOP:

- EHS Lab Safety Manual - List of carcinogens and highly toxic drugs (Chapter 7):
https://ehs.unc.edu/files/2015/07/lab_safety_manual.pdf
- Common drugs considered hazardous by OSHA:
http://www.osha.gov/dts/osta/otm/otm_vi/otm_vi_2.html#app_VI:2_1
- NIOSH List of Hazardous Drugs:
<http://www.cdc.gov/niosh/docs/2010-167/pdfs/2010-167.pdf>

For guidance on preparing, handling and administering the agents, please refer to:

- UNC Environmental Health and Safety Office Hazardous Drug webpage:
<http://ehs.unc.edu/chemical/drugs/>

- Safety Data Sheet (SDS)
<http://ehs.unc.edu/workplace-safety/sds/>
- National Toxicology Program
<http://ntp.niehs.nih.gov/pubhealth/roc/listings/index.html>
- Toxicology Data Network
<http://toxnet.nlm.nih.gov/>

Dosing of Chemical Hazards in Food and/or Water

Any food or water that contains a chemical hazard will be considered contaminated until disposed of properly.

- Water – Left over contaminated water should be collected by research staff, taken back to their lab, and submitted for Chemical Waste pickup. It **cannot** be poured down the sink.
- Food – Left over contaminated food should be collected by research staff, taken back to their lab, and submitted for Chemical Waste pickup.
 - It can also be dumped into a waste bag and boxed for Incineration (with or without contaminated bedding included).
- Any questions about Chemical Waste Disposal, please call EHS at 919-962-5507 or refer to their website at: <http://ehs.unc.edu/manuals/ehsmanual/5-7/>

Contaminated Bedding

Animals **exposed to chemical hazards** may excrete toxic chemicals or toxic metabolites of these chemicals, particularly during the **first 3 days** after dosing. Most of the time, the toxic material or its metabolites would present a hazard in *particulate form* in feces and urine. The precautions outlined below will protect employees in these situations. *For volatile toxic materials, or materials that are toxic at extremely low doses, additional precautions would be necessary.*

The following procedures must be followed for the first 3 days after dosing or until 3 days after the last dose AND until the contaminated bedding is changed. All bedding used within 3 days of dosing will be considered contaminated. The procedures may need to be modified for animals other than rodents. Contact DLAM for information regarding other species.

Notification and Signage

When animals are going to be dosed with a chemical hazard, laboratory workers must provide advance notification to those who will take care of their animals and must label each cage appropriately (see below).

- Within the laboratory, cage labels can take any form that is recognizable to all laboratory workers.
- For animals housed in **DLAM**-managed areas:
 - At least **three** business days prior to dosing the animals, the laboratory will notify the DLAM Facility Manager/**Supervisor** of the dosing schedule and route of administration. **The work cannot begin until the laboratory has obtained confirmation that their scheduling notification has been received.**

- A “Chemical Hazard” sign (also supplied by DLAM) must also be posted on the door (with dosing and contact information filled in).
- There are 2 types of cage cards that should be used to mark animal cages as being a Chemical Hazard (both cards will be supplied by DLAM).
 1. Yellow “Chemical Hazard” cards should be placed on cages by the research staff and should indicate the name of the PI, bar coded cage card number of the affected cage, type of agent being used, route of administration, and date(s) of administration.
 - When using this card, it is implied that this cage will be dosed more than once with a chemical hazard.
 - The last date written on the card should reflect the last time the dose was administered.
 - The last date written on this card is not necessarily the last dose that will be administered for the study.
 2. Lime green “Chemical Hazard Last Dose” cards should be placed on cages by the research staff when the last chemical hazard dose is administered, and should contain all information that is on the yellow card. The date of administration of the last dose should be written at the top of the card.
 - The date written on this card does reflect that the last dose of a chemical hazard has been given to the cage of animals.
 - If a cage is only to be dosed once in a study, PIs should use the lime green “Chemical Hazard Last Dose” card.
- Technicians should notify the Facility Manager/Supervisor when any chemical hazard cage cards are not filled out properly or if the “Chemical Hazard” signage is missing.

Engineering Controls

- Cages will be covered with micro-isolator lids and/or will be maintained on a ventilated rack.
- Cages will be opened (including for cage changing, animal care or study-related reasons) in a ventilated cage changing station, a biological safety cabinet, or a chemical fume hood. **If not available, employees will wear an N-95 respirator or Powered Air Purifying Respirator (PAPR) when working with open cages.**
- If possible, bedding will be dumped in a ventilated dumping station, such as the “Bedding Disposal Cabinets” used in several DLAM facilities.
- If it is necessary to dump cages in the animal room, bedding will be dumped into a plastic waste bag within a biological safety cabinet or a chemical fume hood and disposed of according to the “Dumping Soiled Cages” section listed below.
- If an appropriate chemical fume hood, biological safety cabinet, or ventilated dumping station are not available for dumping bedding, an N95 respirator or Powered Air Purifying Respirators (PAPR) must be worn as indicated below in the PPE section.

NOTE: Autoclaving bedding does not destroy most toxic chemicals and hazardous drugs and if the material is volatile, use of the autoclave may increase the potential for employee exposure by creating harmful airborne vapors. Autoclaving bedding before dumping does **NOT** change the above requirements for ventilation controls while dumping bedding.

- **Bedding that contains chemical hazards will be segregated and collected for incineration.**

Personal Protective Equipment (PPE)

Employees must wear appropriate personal protective equipment for handling animals, cages and bedding:

- For handling animals and cages the following are required:
 - Shoe Covers and Safety Shoes
 - Safety Glasses
 - Face Mask
 - Gloves
 - Bonnet
 - Disposable Lab Coat or Coveralls
- **In addition to the above mentioned PPE**, an **N-95** respirator OR a **PAPR** must be worn whenever opening cages unless a ventilated cage changing station, chemical fume hood or Biological Safety Cabinet is used.
- Safety glasses are to be worn at all times when opening cages, moving cages from eye level or above and handling bedding (filling cages, emptying cages) unless inside a ventilated cage changing station, biological safety cabinet or a chemical fume hood.
- An **N-95** respirator OR a **PAPR** must also be worn when bedding or other animal waste is “dumped” unless a chemical fume hood, Biological Safety Cabinet, **or ventilated dumping station** is used.
 - **NOTE:** Respirator use requires enrollment in the University’s [Respiratory Protection Program](#).

Work Practices Regarding PPE

- Gloves must be changed when they become torn or obviously contaminated with excreta AND before handling animals in other experimental groups.
- Employees will wash hands after removing gloves.
- Safety glasses, after use, can be cleaned with water and detergent, stored in a clean place, and reused.

Changing Cages

- The husbandry technician will change cages following the procedures outlined in the “Working with Animals Under a Biosafety Cabinet or Change Station” SOP, except for the sentinel program (see Sentinel Section below).
- All cages in a room marked as **Chemical Hazard** should be handled and/or changed last.
- All bedding present in a rodent cage within 3 days of dosing will be considered contaminated until it is disposed of appropriately.
- After a cage marked as a **Chemical Hazard** has been changed (animals have been transferred to a clean cage), follow the procedure listed below for the appropriate situation.
 1. If the cage is being changed **before** 3 days post dosing, **regardless of the type of card on the front of the cage-**
 - The “Chemical Hazard” or the “Chemical Hazard Last Dose” card with the dosing information should be placed on the **clean** cage **containing the animals**. This will ensure that bedding from the next cage change (which could still contain contaminated bedding) is also bagged for incineration and NOT sent to the landfill.

- A blank “Chemical Hazard” or “Chemical Hazard Last Dose” card should be placed on the soiled cage to ensure that bedding from this cage is also dumped separately and bagged for incineration.
 - 2. If a cage you are changing has a lime green “Chemical Hazard Last Dose” card and it is at least 3 days post dosing-
 - The lime green card should be transferred to the soiled cage after the technician puts animals in a clean cage. This will identify that the cage needs to be dumped separately and bagged for incineration.
 - 3. If a cage you are changing has a yellow “Chemical Hazard” card and it has been at least 3 days after the last dose-
 - Transfer the yellow card to the clean cage and put a blank “Chemical Hazard” card on the soiled cage. The soiled cage should still be dumped separately and bagged for incineration.
 - Notify your supervisor that the last dose written on the yellow card was at least 3 days prior to the cage change so they can contact the research staff to determine if the last dose has already been administered.
 - If it is confirmed the last dose was administered at least 3 days earlier, the card on the clean cage can be removed.
 - **Do not remove the “Chemical Hazard” card unless this has been confirmed with the research staff.**
- Any cage card marking a soiled cage as a Chemical Hazard should be affixed by closing it in between the lid and the cage bottom. This should be done on the front of the cage to ensure it is easily identifiable in the cage wash area and is separated for dumping and incineration.
- Decontamination of cage changing areas after each use will consist of cleaning up spilled bedding, placing it into a contaminated bedding bag for incineration, and spraying the surface with Virkon S, following the procedures outlined in the “Working With Animals Under A Biosafety Cabinet or Change Station” SOP.

Sentinel Cages

- **Do not take bedding from cages marked as “Chemical Hazards” to sample for the sentinel.**
 - If there are a significant number of cages marked as chemical hazards on the rack and there are very few cages without contaminated bedding to sample, contact the veterinary staff for instructions.
 - If any contaminated bedding is placed into the cage with the sentinel, notify the veterinary staff and treat the cage as a Chemical Hazard (place completed yellow “Chemical Hazard” card on the cage, dump bedding separately and mark for incineration).

Dumping Soiled Cages

- Contaminated bedding should be dumped separately from other bedding and collected for incineration.
- When using a Bedding Disposal Cabinet to dump contaminated bedding, the waste bag should be placed inside the incineration box and placed underneath the disposal cabinet to collect all contaminated material.
 - Follow instructions in the “Engineering Controls” section if dumping outside a ventilated dumping station and/or in the animal room.

- After dumping all contaminated material, the waste bag(s) should be tied closed, sealed inside an incineration box, placed into a carcass cooler, and then recorded on the “Incinerator Box Tracking Sheet”.
 - When the box is sealed, mark the outside of the box as Chemical Hazard with a permanent marker before storing in the carcass cooler.
- When finished dumping cages with contaminated bedding, the cage dumping area should be swept, (again adding any contaminated bedding to the contaminated bedding bag) and mopped or foamed with Vimoba 128. Use the Vimoba mixing station if available to get the correct dilution. You can also mix 1 ounce of Vimoba 128 per 1 gallon of water into a mop bucket.

Potential Exposures

- As with any animal bite or scratch, employees bitten or scratched by animals exposed to hazardous chemicals are expected to notify their supervisor immediately. The employee should also go directly to the University Employee Occupational Health Clinic. For after hours exposures, please call UEOHC at 966-9119.

Changes to Version Dated 02-03-15

- Added that the SOP is to address procedures used to prevent chemical hazard exposure
- Updated EHS links
- Changed MSDS reference to SDS
- Added description of 2 types of cage cards used to flag as Chemical Hazard
- Added instructions to notify manager/supervisor if chemical hazard card(s) are not filled out or if Chemical Hazard sign is missing
- Changed Bio Bubble to Bedding Disposal Cabinets
- Added that all chemical hazard cages should be handled/changed last
- Clarified scenarios for when changing cages (yellow vs. lime green cards) before or after the 3 day chemical hazard shedding period
- Added instructions for how to attach chemical hazard cards to soiled cages in order to flag them for special waste disposal and incineration
- Clarified instructions for dumping cages into a waste bag and sealing inside an incineration box
- Added instructions to added information to the “Incinerator Box Tracking Sheet”
- Added instructions to mark incinerator boxes as a chemical hazard with a permanent marker

Examples of Chemical Hazard Cards

CHEMICAL HAZARD

Chemical Agent: _____

P.I. _____

Cage Card #: _____

Route of Administration
(Please Circle):

Parenteral

Oral

- Feed
- Water
- Gavage

Topical

Date: _____

CHEMICAL HAZARD

DATE OF LAST DOSE: _____

Chemical Agent: _____

P.I. _____

Cage Card #: _____

Route of Administration
(Please Circle):

Parenteral

Oral

- Feed
- Water
- Gavage

Topical

CAUTION



CHEMICAL HAZARD

Dates of chemical hazard administration/exposure must be documented on the Chemical Hazard Cage Cards!!!

For 3 days after administration/exposure AND until bedding is changed:

- Open all contaminated cages in a ventilated cage changing station, biological safety cabinet, or chemical fume hood. **If those are not available, employees must wear an N-95 respirator or PAPR when working with open cages.** This includes DLAM cage changing.
- Don gloves, (closed-front) gown, shoe covers, and N-95 respirator (plus face shield, safety glasses, or goggles) OR PAPR before dumping bedding. (Note: If bedding is dumped inside a chemical fume hood or biological safety cabinet, the respiratory and eye protection are not required).

CHEMICAL AGENT	LAB CONTACT NAME	CONTACT PHONE #	PROTOCOL #	RACK # and CAGE LOCATION