

# Dickinson

## **Occupational Health & Safety in the Animal Care and Use Program**

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## **I. Purpose and Application**

The purpose of this program is to prevent occupational injuries and illnesses associated with the care and use of research animals. This program is an addition to, not a replacement for other health and safety programs at Dickinson College, including but not limited to those addressing: chemical hygiene, Bloodborne pathogens, radioactive materials, personal protective equipment, and waste management. Other safety plans and procedures can be obtained from the Department of Environmental Health & Safety.

Dickinson College is required to have an occupational health and safety program (OHSP) to be in compliance with the Office of Laboratory Animal Welfare (OLAW), Public Health Service and the Animal and Plant Health Inspection Services (APHIS), United States Department of Agriculture. The primary reference for development of this program was *Occupational Health and Safety in the Care and use of Research Animals* (National Research Council, 1997).

This program applies to all employees of Dickinson College with frequent or substantial exposure to research animals including faculty, staff, and students who may have direct or indirect contact. All participants in the OHSP will be provided a health survey to complete (Appendix A). The health survey will be reviewed by the occupational health physician to determine immunization status, and any existing medical conditions that create an animal contact health risk. Additional medical evaluation (eg – allergy testing) may be necessary at the discretion of the occupational health physician. The occupational health physician will recommend any necessary accommodations required for the individual to work with the animal species specified on the health survey form. Students who are only exposed to animals in a classroom setting are not required to participate in the OHSP.

## **II. Responsibilities**

- A. The President of the College has ultimate responsibility for occupational health and safety in the care and use of research animals. General oversight responsibility is assigned to the Provost.
- B. The Director of Environmental Health and Safety assists with the recognition, evaluation and control of hazards in the workplace and:
  - i. Conducts general safety training
  - ii. Maintains records
  - iii. Performs site inspections
  - iv. Audits safety programs
  - v. Contracts occupational health services
  - vi. Assists with accident investigations
  - vii. Assists with facility design
  - viii. Maintain a safety information library
- C. The Principal Investigator has primary responsibility for safety in the workplace and:
  - i. Distributes annual health survey forms

- ii. Maintains records
- iii. Provides site specific training to employees
- iv. Properly manage hazardous waste until transfer to the central accumulation area.
- v. Maintaining good housekeeping
- vi. Cleaning UV lamps on biological safety cabinets
- D. The Department of Facilities Management has responsibility for:
  - i. Contracting equipment performance testing and certification
  - ii. Maintaining buildings and equipment
- E. The Institutional Animal Care and Use Committee (IACUC) approves all work conducted on live vertebrate animals and:
  - i. Inspects animal facilities on a semiannual basis
- F. The Institutional Biosafety Committee (IBC) approves all work involving biohazardous materials; human, animal, and plant pathogens; toxins; allergens; and recombinant DNA.
- G. The Radiation Safety Officer (RSO) approves all work with radioisotopes or radiation producing machines.

### **III. Hazard Recognition**

#### **A. Physical Hazards**

##### **1. Bites, Kicks, Scratches**

Most animals are capable of biting and scratching. Using proper handling methods will help prevent bites, kicks, and scratches. New workers should review educational materials on safe animal-handling techniques and should have supervised instruction before undertaking a new procedure. Personal protective equipment such as leather gloves over nitrile gloves and lab coats should be worn.

The bacteriology of bite wounds is dependent on the oral flora of the animal. Workers must keep their tetanus shots up to date, report all injuries as soon as possible, and seek prompt medical assistance following exposure.

##### **2. Sharps**

Needles and syringes, broken glass, pipettes, and scalpels are commonly used in animal facilities. Where these sharps are used a puncture-resistant and leak proof container is needed for disposal. Where blood and other potentially infectious materials are used, workers must be trained on the exposure control plan. Sharps and other materials potentially contaminated with Bloodborne pathogens, must be disposed of as hazardous waste. Contact Environmental Health & Safety at 245-1495 for guidance.

### 3. Nonionizing Radiation

Ultraviolet radiation is often used to sterilize surfaces in animal care facilities—particularly in biological safety cabinets. Employees with exposure to UV light must wear skin and eye protection.

Additionally, chlorinated solvents should not be used around UV light or the toxic gas, phosgene, may be produced.

### 4. Ionizing Radiation

Researchers using radioactive materials or radiation producing machines should refer to the Dickinson College Radioactive Materials Safety Program. Any protocol using radioactive substances must be approved by the Radiation Safety Officer prior to approval by IACUC.

### 5. Ergonomics

Repetitive motions and heavy lifting are the most common causes of ergonomic injuries in animal research. Activities contributing to injury include lifting heavy feed bags, lifting heavy animals, lifting bulky cages, and mopping.

### 6. Machinery

Improperly guarded machines can cause injury by pinching or crushing body parts. Cage washers and other machinery should be evaluated to determine where nip, pinch, and crush points exist and those points should be guarded appropriately.

### 7. Noise

When noise exceeds an 8-hour average of 85 dBA, employees must be placed in the Dickinson College Hearing Conservation Program. When noise exceeds an 8-hour average of 90 dBA, employees are required to wear hearing protection. Common sources of noise in animal facilities include the animals (particularly dogs and pigs), and cage washing equipment.

## **B. Chemical Hazards**

Chemicals are ubiquitous. They may be flammable, corrosive, reactive, or toxic. Common chemicals found in animal facilities include anesthetic gases, drugs, preservatives, and disinfectants. Researchers using

hazardous materials should refer to the Dickinson College Chemical Hygiene Plan.

## **C. Biological Hazards**

### 1. Infectious Agents

Researchers using infectious agents should refer to *Biosafety in Microbiological and Biomedical Laboratories* (CDC-NIH 1993). It identifies four biosafety levels and their respective control methods. Researchers working with recombinant DNA should refer to *Guidelines for Research Involving Recombinant DNA Molecules* (NIH 1994). Any protocol using infectious agents or recombinant DNA must be approved by the Institutional Biosafety Committee prior to approval by IACUC.

### 2. Allergens

Allergies to animals are probably the most significant occupational hazard—with an estimated 10% to 44% of animal care workers developing symptoms. Workers may be allergic to proteins found in animal hair, dander, urine, saliva or feces. Common reactions, include: runny nose and/or sneezing, itchy and/or watery eyes, red and/or itchy skin, and difficulty breathing (asthma). More severe reactions, known as anaphylaxis, include: throat tightness, eye or lip swelling, difficulty swallowing, hoarseness, shortness of breath, dizziness, fainting, nausea, vomiting, and diarrhea.

Nearly 75% of employees with pre-existing allergies develop allergies to laboratory animals and roughly 10% develop occupational asthma, therefore, prospective employees will be required to complete an initial Animal Care and Use Health Survey (Appendix A) to assess their allergy risk. This survey will not preclude employment. Annual surveys will be administered to employees to detect those who are developing allergic symptoms. Allergy shots may be beneficial for some individuals. Employees with asthma symptoms are advised to obtain annual pulmonary function tests. Individuals with severe allergies should consult a physician regarding the use of a self-administered form of epinephrine.

To prevent or reduce allergies, animal work should be done in a well ventilated area. Exhaust air shall be HEPA filtered if it will be recirculated to the room. Animal cages should be cleaned and bedding changed frequently. Cage cleaning should be done in a ventilated hood or work station when feasible. Ventilated or filter-top cages with solid bottoms are recommended. Absorbent pads are recommended over wood-based chips or saw dust.

Workers must wear gloves and a lab coat. Filtering face piece respirators are recommended. All personal protective equipment must remain in the workplace. Employees are encouraged to wash their hands frequently.

### 3. Zoonosis

The transmission of diseases between animals (including humans) is uncommon in the laboratory environment when healthy animals are purchased from reputable vendors and then properly cared for under the direction of a veterinarian. Researchers should be aware of zoonoses specific to the animal species they are working with and take necessary precautions to control these hazards. The use of wild caught animals is discouraged. Control methods include but are not limited to: preventing bites and scratches, adequate ventilation and respiratory protection, frequent hand washing, and good personal hygiene. Contact the Department of Environmental Health & Safety for additional information on animal specific zoonoses.

## IV. Control Measures

Exposures to occupational hazards can be eliminated or reduced by applying a hierarchy of engineering, work practices, and the use of personal protective equipment. Hazards should first be removed or reduced by engineering controls. When that is not feasible, work practice or administrative controls should be used to remove or reduce the hazard. When that is not feasible, personal protective equipment can be used as a last resort to reduce the hazard.

### A. Engineering Controls

#### 1. General Room Ventilation

Dilution ventilation helps reduce the level of allergens caused by dander and excreta and helps control temperature and humidity to ensure personnel comfort. Higher volumes of air exchange are needed in cage cleaning and washing areas where the level of allergens and heat load are the greatest. To protect against exposure to chemical and biological hazards, it is often necessary to employ local exhaust ventilation in addition to general room ventilation.

#### 2. Local Exhaust Ventilation

##### a. Chemical Fume Hoods

Chemical fume hoods provide local exhaust ventilation to protect employees from aerosols, fumes, vapors, and gases generated during the use of chemicals.

Fume hood performance must be certified annually to ensure an average face velocity between 80—120 fpm.

#### b. Biological Safety Cabinets

Biological safety cabinets provide containment for infectious agents. Depending on the type of safety cabinet it may provide protection to the biological agent, personnel, or both and it may or may not be used as a fume hood.

Biological safety cabinets must be tested and certified after installation or after being moved, and recertified at least annually by appropriately trained personnel.

The biocidal capacity of UV lights in biological safety cabinets decreases with time and is adversely affected by contamination with dust or chemical films. Bulbs should be cleaned once a week and replaced on a regular schedule to maintain proper performance.

#### c. Cage Systems

It is common in animal research facilities to use cage filter tops to prevent cross contamination among animals and between animals and people. Cage filter tops prevent particles from entering cages. Less common are isolation cages with filter tops. These cage tops form a seal with the cage providing complete isolation between animals. Isolation cage tops should only be removed in biological safety cabinets to maintain isolation.

Ventilated cage systems use local exhaust to contain and exhaust bioaerosols. They maintain negative pressure within the cage with respect to the surrounding environment and exhausted air is filtered through a HEPA filter.

#### d. Autoclaves

Autoclaves use high pressure steam to sterilize equipment and material before use or disposal. Autoclave performance must be validated using biological indicators to ensure proper sterilization.

#### e. Downdraft Tables

Downdraft tables capture and exhaust chemical vapors during necropsy by drawing air down and away from workers. They are not effective in protecting workers against bioaerosols.

## **B. Administrative (Work Practice) Controls**

Where hazards cannot be controlled by engineering, work practice controls shall be used.

### 1. Access

Access to animal facilities is limited to authorized personnel only.

### 2. Animal Handling and Restraint

All employees, students, and visitors who will handle animals shall be trained in proper animal handling techniques. Employees should wear personal protective equipment specific for the animal being handled. Species specific restraint techniques should be used. Where possible choose a mechanical or chemical restraint over manual restraint. Be aware that physical restraint increases the likelihood of exposure to animal excreta and aggressive behavior.

### 3. Housekeeping

Animal facilities must be kept clean and free of obstructions. Work surfaces should be decontaminated after spills and wiped with disinfectant at the end of each work day. Floors should be cleaned and disinfected at least weekly using a HEPA vacuum then a wet mop.

### 4. Personal Hygiene

Employees should wash their hands frequently, and always before and after handling animals and before eating, drinking, smoking, or applying cosmetics. Eating, drinking, smoking, or applying cosmetics is prohibited where animals are housed or used.

### 5. Waste Disposal

Employees should refer to the Dickinson College Comprehensive Waste Management Program.

### 6. Occupational Health Services

Occupational health services at Dickinson College are provided by U.S. Healthworks, 1124 Harrisburg Pike, Carlisle. Services include but are not limited to:

- providing immunizations (e.g. – tetanus or rabies)
- providing medical surveillance when exposure monitoring reveals exposure above the OSHA action level for regulated substances (e.g. – formaldehyde)
- providing post-exposure prophylaxis (e.g. – rabies)
- respirator fit testing and medical clearance
- providing pre-placement, periodic, and post-employment health evaluations to employees who have substantial animal contact or cage cleaning duties.

Determining whether or not there is substantial contact and the frequency of periodic health evaluations is a matter of professional judgment based on a number of risk factors including the level of exposure, the length of exposure, and the specific hazards.

All occupational injuries or illnesses (including animal bites, regardless of severity) must be reported as soon as possible to your department supervisor, Human Resources and the Department of Environmental Health & Safety.

Emergency medical treatment can be obtained at the Carlisle Regional Medical Center, 361 Alexander Spring Road, Carlisle.

### **C. Personal Protective Equipment**

The Occupational Safety and Health Administration (OSHA) requires employers to protect their employees from workplace hazards such as machines, work procedures, and hazardous substances that can cause injury. The preferred way to do this is through engineering controls or work practice and administrative controls, but when these controls are not feasible or do not provide sufficient protection, an alternative or supplementary method of protection is to provide workers with personal protective equipment (PPE) and the know-how to use it properly.

Employees should refer to the Dickinson College Personal Protective Equipment Program for guidance on the proper selection, use, and maintenance of personal protective equipment.

When handling animals a minimum of rubber gloves and a lab coat should be worn. Filtering face piece respirators are recommended but not required.

When restraining animals or performing procedures likely to result in bites or scratches, leather gloves should be worn over top of the rubber gloves.

When changing animal bedding or manually cleaning cages, a minimum of rubber gloves, lab coat, eye protection and a NIOSH approved N-95 respirator should be worn.

Personal protective equipment should be removed before leaving the animal facility.

## **V. Training**

Training shall be provided prior to initial exposure to hazards in the animal care facility. Retraining shall be provided when changes in the workplace render previous training obsolete, as required by OSHA, or when inadequacies indicate that the employee has not retained the requisite knowledge.

Training topics should include, but are not limited to:

- Requirements of the Dickinson College OHSP
- Animal Handling and Use
- Hazards found in the Animal Care Facility
- Hazard Control Methods
- Waste Management Procedures
- Emergency Response Procedures

General safety training will be provided by the Department of Environmental Health & Safety. Site and animal specific training shall be provided by the principal investigator.

## **VI. Emergency Procedures**

Emergency response should follow the following hierarchy: protect personnel, then animals, and finally the animal care facility and surrounding buildings. Provisions for relocating animals to temporary housing should be included.

### **A. Fire**

The following steps are basic protocol for handling a fire or fire-related emergency situation in the laboratory:

1. Pull the fire alarm.
2. Evacuate
3. Do NOT attempt to extinguish a fire unless you have first warned others and/or activated an alarm
4. Call 911 from a safe location.

5. Contact Public Safety at 1111 and the chemical hygiene officer at 245-1495 or 752-5219.

A fire in a small vessel can usually be suffocated by covering the vessel. If the fire is burning over an area too large to be suffocated quickly (within 30 to 45 seconds) and simply, leave the firefighting to those who have been trained and equipped. If you have been trained in the use of fire extinguishers, fight the fire from a position from which you can escape, and only if you are confident that you will be successful. It is easy to underestimate a fire.

## **B. Spill**

Refer to the Dickinson College Chemical Hygiene Plan, Exposure Control Plan, or Radioactive Materials Safety Plan for detailed instructions on emergency and nonemergency spill response.

## **C. Injury or Illness**

For non-emergency medical treatment, under current Dickinson College policies and procedures, affected employees must seek care from a panel of approved providers. The approved provider list may be obtained by contacting the Office of Human Resources. For emergency treatment, go to the nearest facility and schedule a follow-up treatment with an approved provider. This can best be accomplished at:

Carlisle Regional Medical Center  
Department of Emergency Medicine  
361 Alexander Spring Road  
Carlisle, PA 17013  
717-249-1212

If you have any questions regarding injury and illness procedures, contact your supervisor or the Department of Human Resources at 245-1503.

## **VII. Record Keeping**

### **D. Medical Records**

Medical Records shall be maintained in accordance with 29 CFR 1904.

### **E. Training Records**

Training records shall be maintained at the department level with copies provided to the Department of Environmental Health & Safety.



APPENDIX A  
DICKINSON COLLEGE

**Animal Care and Use Health Survey**

Employee Name \_\_\_\_\_ Date \_\_\_\_\_

Animal Species Used or Cared  
For \_\_\_\_\_

Medical History (Please check all that apply).

- |   |   |   |
|---|---|---|
| <input type="checkbox"/> Asthma               | <input type="checkbox"/> Chest Tightness                                    | <input type="checkbox"/> Itchy Eyes         |
| <input type="checkbox"/> Hay Fever            | <input type="checkbox"/> Wheezing   | <input type="checkbox"/> Pneumonia          |
| <input type="checkbox"/> Hives                | <input type="checkbox"/> Coughing   | <input type="checkbox"/> Current or Planned |
| Pregnancy                                     |   |   |
| <input type="checkbox"/> Allergies to Animals | <input type="checkbox"/> Shortness of Breath                                | <input type="checkbox"/> Diabetes           |
| <input type="checkbox"/> Seasonal Allergies   | <input type="checkbox"/> Eczema   | <input type="checkbox"/> Seizures           |
| <input type="checkbox"/> Food Allergies       | <input type="checkbox"/> Undergoing Chemotherapy or Radiation Therapy       |   |
| <input type="checkbox"/> Allergies to Insects | <input type="checkbox"/> Immune System Suppressed by Disease or Other Cause |   |
| <input type="checkbox"/> Sneezing             | <input type="checkbox"/> Chronic Cardiovascular Disease                     |   |
| <input type="checkbox"/> Runny Nose           | <input type="checkbox"/> Chronic Respiratory Disease                        |   |

Do you have any illness or injury presently?  Yes  No  
If yes, list \_\_\_\_\_

Are there any other medical conditions we should be aware of prior to employment?  Yes  No  
If yes, explain \_\_\_\_\_

Prescription Medications \_\_\_\_\_

Allergies to Medications \_\_\_\_\_

When was your last Tetanus shot? \_\_\_\_\_(year)

*\*If greater than 10 years, must have a booster before employment.*

*If greater than 5 years, booster highly recommended.*

**OVER**

ANIMAL CARE AND USE HEALTH SURVEY

EMERGENCY NOTIFICATION:

Last name \_\_\_\_\_ First name \_\_\_\_\_

Address \_\_\_\_\_

City/State \_\_\_\_\_ Zip \_\_\_\_\_

Telephone # Home (\_\_\_\_) \_\_\_\_\_ - \_\_\_\_\_ Work (\_\_\_\_) \_\_\_\_\_ - \_\_\_\_\_

INSURANCE INFORMATION

Name of Insurance Company \_\_\_\_\_

Insurance numbers (please give all numbers listed) \_\_\_\_\_

Do you belong to a pre-paid health plan, or Health Maintenance Organization?  Yes  No

Do they need to be called to authorize an ER visit?  Yes  No

If yes, please provide telephone number of Health Plan. (\_\_\_\_) \_\_\_\_\_ - \_\_\_\_\_

<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> I have responded to the above questions truthfully and to the best of my knowledge <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> I was given the opportunity to complete this form and chose not to.  <p>_____</p> <p>Employee's signature <span style="float: right;">Date</span></p>
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Reviewed by \_\_\_\_\_ Date \_\_\_\_\_