

CAUT Health and Safety Fact Sheet



Animal Hazards

ISSUE 9

Whether in a laboratory, or out in the field, contact with animals can pose an occupational health and safety hazard. The traditional research lab, with 'lab rats' in a 'sterile, white environment', is the picture that usually comes to mind when referring to working with animals in the academic setting. Academic staff working with animals come from varied disciplines, including research, veterinary sciences, medicine, pharmaceuticals, and chemistry. But they also include forestry, botany, archeology, geology, fisheries, and zoology. In these instances, where the laboratory is in the field, contact with animals or their environments may occur, either deliberately or accidentally. This can be just as hazardous as working in a contained environment.

For example, rabies can be contracted either in an indoor lab or in the field, from bites of infected animals. The Hantavirus can be contracted from disturbing the living environments of mice, inhaling the dust produced from their feces and thus succumbing to the illness.

Poor laboratory hygiene practices not only increase the likelihood of human injury or illness, but also the transmission of disease between lab animals.

This fact sheet will deal with common hazards, and some of their safety and prevention protocols. The starting point is an assessment of potential health and safety hazards. The development of safety measures and protocols is next, in accordance with federal and/or provincial regulations, accepted practices, professional association guidelines and worksite policies. They will need to be coordinated with the workplace Joint Health and Safety Committee who will have to draft specific protocols for workplace inspections, required by federal and provincial Occupational Health and Safety Acts. Finally, monitoring and follow-up mechanisms are essential to ensure compliance with proper procedures and correcting or addressing new issues.

Faculty, investigators, post-doctorate fellows, research staff, graduate and other students, lab technicians and ancillary animal care workers will all need to be considered when safety policies are put in place.

Training

The Canadian Council on Animal Care (CCAC) is responsible for overseeing animals used in research, teaching and testing. They have produced several sets of guidelines on laboratory safety for both animals and staff. As well as CCAC's own course models, they offer a

Regulations

Health Canada

Health of Animals Regulations
C.R.C., c. 296

Health Canada

Health of Animals Act
[SOR/91-525, s.1]

Health Canada

Reportable Diseases Regulations
SOR/91-2

Health Canada

Laboratory Biosafety Guidelines
3rd Edition 2004

WHMIS

www.hc-sc.gc.ca

For more information:

Laura Lozanski

Health and Safety Officer
CAUT

Tel (613) 820-2270

Fax (613) 820-7244

Email lozanski@caut.ca

Published by the

Canadian Association of University Teachers

2675 Queensview Drive

Ottawa, Ontario K2B 8K2

www.caut.ca



CAUT

MARCH 2006

guide for institutions who develop in-house training programs: “*CCAC guidelines on institutional animal user training*” (1999). They advise that “*All personnel involved with the use of animals in research, teaching and testing must be adequately trained in the principles of laboratory animal science and the ethical issues involved in animal use,*” and encourage programs to be offered on a regular basis and given prior to beginning any animal-based work.¹

Common Laboratory Hazards²

Accidents

- Slips, trips and falls (slippery surfaces)
- Struck by heavy objects during handling
- Electric shocks caused by defective or incorrectly operated equipment
- Cuts and pricks from sharp objects, broken glass and syringes
- Bites, goring and/or attacks by domestic or wild animals
- Kicks, bites, scratches and stings by lab animals (primates, dogs, cats, rabbits, guinea pigs, rats, mice, hamsters, snakes, wasps, etc.), domestic animals, honeybees, and zoo and other animals
- Fires caused by flammable materials
- Explosions of animal-food dust/air mixtures

Physical

- Exposure to ionizing radiation from x-ray equipment and lab animals investigated or treated with radioisotopes and from their secretions
- Exposure of skin and eyes to ultraviolet radiation used for sterilization, etc.
- Cold or heat stress
- Health problems from high humidity, winds, concrete floors

Chemical

- Intoxication from pesticides, solvents, strong acids and alkalis, detergents
- Dermatoses from chemicals and animal medications
- Allergies to formaldehyde and other allergenic substances
- Systemic and gastrointestinal effects from cytotoxic agents
- Exposure to various carcinogenic, mutagenic and teratogenic agents
- Latex sensitivities and/or allergies

Biological

- Infections from sick or pathogen-carrying animals or airborne pathogens, resulting in development of communicable diseases (zoonoses). Laboratory-animal allergies (LAA): occupational asthma, allergic alve olitis, bronchitis, pneumonitis, rhinitis, skin rashes, and diseases of the airways caused by inhalation of animal food dust containing microorganisms and their spores
- Pulmonary dysfunctions
- Acute health effects caused by various flea-control products
- Increased risk of laboratory-acquired HFRS (hemorrhagic fever with renal syndrome) caused by infected lab rats

- Occupational eczemas and contact dermatitis
- Various septic infections

Ergonomic & Psychosocial

- Musculoskeletal problems
- Addiction to drugs, availability of animal medications

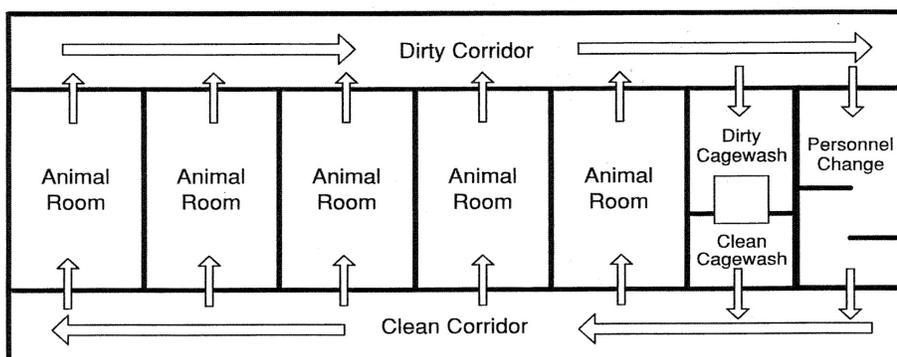
Safe Practices

- Develop laboratory safety protocols in concert with the Joint Health and Safety Committee, legislation, regulations and professionally accepted practices
- Ensure all staff working in and around indoor or field labs have been adequately trained
- WHMIS training
- Know where emergency exits and numbers are
- Use Personal Protective Equipment (PPE)
- Follow proper procedural protocols
- Trained in understanding animal behaviour
- Assess safety hazards before proceeding
- File a field plan when working outside a facility
- Outdoor Emergency Preparedness training and protocols
- Training in working around aircraft, diving, climbing, working at high altitude or extreme temperature conditions and on ice
- Follow safe health practices guidelines (medical surveillance programs, vaccinations, exposure levels, illness, injury and accident reports, etc.)

Laboratory Safety Checklist

Key Elements: construction, ventilation, sanitation, security, lighting, safe protocols and safety equipment

- Meets all federal, provincial and municipal regulations and guidelines
- Designed to facilitate sanitation processes
- Materials and finishes should be durable, impervious and resistant to water and chemicals used in their sanitation
- Appropriate sanitation and sterilization of equipment
- Floors, walls and ceilings should meet accepted or legislated practices
- Properly designed ventilation systems with Hepa filters
- Security systems that limit access to authorized individuals
- Segregated clean and dirty work areas
- Facilitates the proper storage and removal of waste
- Has access to reliable sources of water, electricity and sewage disposal, including emergency power
- The ability to segregate sick or contaminated animals
- Provides for aseptic technique according to current veterinary standards
- Biohazardous waste, hazardous materials and radionuclide waste stored separately, and disposed of in accordance with all federal, provincial and municipal requirements
- Separate janitorial services, cleaning supplies and equipment are required for different zones and must not be transferred from one area to another
- Strategically placed barriers to prevent cross-contamination and segregate incompatible activities
- Corridors must be wide enough to accommodate movement of equipment and animals
- Sources of radiation must meet current radiation safety guidelines by the Canadian Nuclear Safety Committee (CNSC) and must be approved by the local radiation safety officer
- Staff areas such as break rooms, washrooms, and change/shower facilities must be in the work area vicinity but be safety contained from work contamination
- Traffic flow patterns should progress from cleanest to dirtiest



Clean/dirty corridor system³

Diseases Encountered from Animal Contact

Occupations requiring people to come in contact with humans or other animal species can open the risk of contracting diseases that are not normally found in normal population living areas. Non-indigenous animal species and unusual or specialized research projects may expose workers to specific types of illnesses that require extra caution and care. This is a brief synopsis⁴ of some transmittable diseases that can be contracted in relation to animal care and research :

Anthrax – bacterium, *Bacillus anthracis*; affects the skin, lungs, mouth, throat and gastrointestinal tract; contracted through spores from infected animals entering a cut/abrasion, inhalation or ingestion; person-to-person transmission is unlikely (animal breeders; veterinarians/workers; wildlife, agricultural, lab workers)

Cercopithecine – ascending encephalomyelitis, Cercopithecine Herpes Virus 1; acute and usually fatal; exposure to monkeys; contracted through bites; can be transmitted through a non-intact skin system (monkey contact, veterinarians/workers, lab workers)

Hantavirus – virus causing the serious lung disease Hantavirus Pulmonary Syndrome (HPS); 50-60% die; contracted through inhalation of dust of feces of infected mice/rodents; person-to-person transmission in North America has not been reported

but has been found in genetically distinct viruses in South America (contact with mice/rodents and their environs)

Histoplasmosis – fungus, *Histoplasma capsulatum*, which infects the lungs; wild and domestic bird droppings produce spores (5 different forms) which are inhaled; estimated 500,000 persons test positive in North America each year (archaeologists, geologists, medical lab techs)

Lyme Disease – bacteria, *Borrelia burgdorferi*; affects joints, heart, brain, can cause birth defects; caused by ticks associated with deer/wildlife; where disease is common, up to 24% of general population have positive blood tests for exposure; is not transmitted from person to person (outdoor workers)

Psittacosis – infection or disease caused by *Chlamydia psittaci*, from contact with wild or domestic birds; inhalation of organisms from urine, respiratory secretions or dried feces of infected birds; person-to-person transmission is rare unless exposed to paroxysmal coughing during acute illness; fatal cases rare (working with birds, veterinarians/workers, diagnostic lab employees, public health inspectors)

Q Fever – microbe, *Coxiella burnetii*; inhalation of infectious aerosols/contaminated dusts of animals or animal products from wild/domestic animals, particularly sheep and cats; person-to-person transmission rare (lab

animal researchers/support staff, veterinary/zoo workers, medical/health care workers who have contact with infected patients)

Rabies – virus; spreads from animals to humans through brain and nervous system; contact with saliva, body fluids or tissues of infected wild/domestic animals; fatal if not treated; 3,000 Canadians rabies-immunized annually from contact with animals suspected of rabies (animal workers, lab animal researchers/techs, veterinarian/workers).

Working Safely with Experimental Animals ⁵

- understand basic animal behaviour in relation to their interactions with people during handling
- appreciate the “flight zones” typical of a species
- understand how to communicate with the animals
- use appropriate restraint techniques
- use restraint equipment properly
- identify any animals that may be unpredictable
- wear appropriate protective clothing and equipment
- maintain appropriate vaccination status

Resources

Health Canada: Laboratory Biosafety Guidelines, 3rd Edition 2004; MSDS Infectious Substances www.hc-sc.gc.ca

Canadian Council on Animal Care 2003 www.ccac.ca

National Research Council, USA, Occupational Health and Safety in the Care and Use of Research Animals

Canadian Association for Laboratory Animal Medicine www.uwo.ca/animal/website/CALAM/ACMAL

Canadian Centre for Occupational Health and Safety (CCOHS) www.ccohs.ca

International Labour Organization Occupational Safety and Health Information Centre www.ilo.org

Endnotes

1. CCAC guidelines on: institutional animal user training (1999) and Recommended Syllabus for an Institutional Animal User Training Program (1999)
2. International Hazard Datasheets on Occupation, Animal Handler, ILO
3. CCAC guidelines on: laboratory animal facilities – characteristics, design, and development (2003)
4. Please consult Health Canada, the Centres for Disease Control, the Canadian Centre for Occupational Health and Safety or other sources for detailed information
5. CCAC Occupational Health and Safety, Module 4