

HEALTH AND SAFETY INFORMATION FOR CVM STUDENTS

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INTRODUCTION

Health and safety of students in MSU's College of Veterinary Medicine is of major importance to the faculty and staff. This program is designed to protect both people and animals.

GENERAL SAFETY RULES

- Safety is promoted and achieved through good facilities and equipment, the establishment and enforcement of safety rules, informed and trained personnel, and the use of appropriate protective clothing and equipment.
- As a rule, the incidence of zoonoses (i.e., diseases of animals transmissible to man) is low among personnel handling or using laboratory animals, and a long listing of these diseases may produce a distorted impression of the actual risks involved. Some of the more common and serious diseases are described later in this document.
- In general, health and safety matters are related to facility and equipment design, the species you work with, the frequency and type of contact, and your own health status.
- General cautions to observe are:
 1. Remember that accidents, cuts, scratches, and allergic reactions are the most common hazards.
 2. Your safety and the safety practices of others depend to a large extent on your being alert to potential dangers.
 3. Do not take unnecessary chances.
 4. Read and obey posted signs and information.
 5. Ask questions, if you are not sure. Do not hurry risky procedures.
 6. Keep floors, walls, sinks, and all fixed equipment uncluttered and clean.
 7. Place, stabilize, store, and operate movable equipment properly.

8. When pests (insects, wild rodents) are noted, notify a supervisor. He/she will arrange for the pest exterminator to rid the area of pests. The unauthorized use of pesticides can be hazardous to personnel and may be disruptive to research.
9. Wash hands with soap when leaving an animal room or, if the building is served by a common sink, when leaving the building.
10. Use only the antiseptics, disinfectants, and detergents selected by a supervisor and use precisely as directed. If used improperly, these chemicals can be ineffective, wasteful, and even hazardous. Fumigants, experimental chemicals, and compressed gases may be dangerous also.
11. Seal animal carcasses, waste bedding, and other biological wastes carefully in double plastic bags or in a barrel, and label and place in an assigned, refrigerated storage area.
12. Dispose of syringes, needles, and other “sharps” in containers provided for that purpose. Do not allow containers to become overfilled. **Do not recap syringes** unless instructed to do otherwise.
13. Wear protective clothing and use animal restraint techniques and equipment as instructed by a competent person.
14. Report all bites, scratches, kicks, or injuries inflicted by an animal or object.
15. Clean and clear the work area.
16. Do not smoke, chew, eat, drink, or apply cosmetics in animal use or housing areas.
17. Place damaged/broken equipment aside, label the equipment as damaged/broken, and notify a supervisor so the equipment can be repaired.
18. Do not overload carts, obscure vision, or add excess weight to transport carriers.
19. Sweep (never pick up) broken glassware with a brush and dust pan. Do not pick up glass with fingers.
20. Avoid animal species that you have not or are not being taught to handle.
21. Master proper methods for lifting. Do not lift heavy or awkward objects without instruction or assistance.
22. Take care when walking on slippery or irregular floors.
23. Review the rest of this text.

PERSONAL HYGIENE

1. Wear appropriate protective clothing in animal areas.
2. Whenever bare hands, arms, neck/face, or head become accidentally or unavoidably contaminated with animal blood, urine, feces, or hair, such contamination should be removed as soon as possible by washing thoroughly with water and soap. When such contamination enters the mouth or eyes, the material should be removed quickly by washing with generous amounts of water. Gloves should be discarded or hands washed when leaving an animal room. Sinks, soap, and hand towels are available in animal rooms or nearby.
3. Personnel must not smoke, eat, or drink in rooms or areas where laboratory animals are housed and/or used. In some circumstances, a shower should be taken when entering the facility at the beginning of the work day and when leaving at the end of the day.
4. The college has special containment rooms, designed for projects involving known

hazardous agents. Do not enter these rooms unless supervised. Projects involving hazardous agents or materials have very strict requirements for clothing and procedures. Containment procedures are for the protection of personnel and other animals.

Types of Hazards

Physical Agents: Sharp objects, slippery floors, broken or weak supports, heavy weights, and many other conditions pose a physical hazard.

Radioisotopes: Radioisotopes are radioactive forms of normally nonradioactive elements. They emit low levels of radiation, which makes them valuable as tracers in biological investigations of metabolic processes. Usually these types of isotopes are dangerous only if contacted directly. The use of some, however, requires stringent precautions and safety measures. A radiation monitoring badge that records radiation exposure should be worn by all staff working with radioisotopes. The Chemical, Radiation, and Laboratory Safety Officer may be contacted at 325-3294.

Pathogens: Pathogens are live infectious bacteria, viruses, fungi, or parasites that pose a threat to humans and animals. Some pathogens and their diseases are, for example, tuberculosis in monkeys, cryptosporidiosis in cattle, or Q-fever in sheep. Many pathogens are blood-borne. Other pathogens are utilized as a component of some research studies. In all cases a set of standard safeguards and procedures should be developed by the facility management to protect technical staff and investigators. The Biosafety Officer may be contacted at 325-3294.

Mutagens: Mutagens are substances that cause changes in chromosomes and thereby induce the occurrence of mutations. Examples of such substances are high doses of X-rays and some chemicals.

Carcinogens are substances that can produce cancer directly.

Toxins and Chemicals: Toxins are poisonous substances produced by bacterial, plant, or animal cells. Some bacteria, for example, produce tetanus toxins, and castor bean plants produce a toxin called ricin. Anesthetic gases and drugs may be toxic. The Chemical Safety and Hazardous Waste officers may be contacted at 325-0994.

Hazard Containment

- Exposure to potentially hazardous biological, chemical, radiological, or physical agents should be monitored.
- Protective devices should be used when possible, and other safety practices consistent with current safety guidelines should be adopted.
- Potentially hazardous chemicals in the animal laboratory or care room may be found in disinfectants, cleaning agents, or pesticides, and as feed and bedding contaminants.

- Hands should be washed after removing gloves, handling chemicals, infectious materials, animals, and before leaving the laboratory.
- A certified biological safety cabinet and gloves should be used when handling infectious materials, and a certified fume hood used when handling toxic materials.
- All work surfaces--after use and daily--should be decontaminated. All contaminated materials should be decontaminated (by autoclaving or chemical disinfection) before washing, reuse, or disposal. The decontamination procedure will vary with the agent.

MEDICAL RESTRICTIONS, PREGNANCY, AND PHYSICAL OR MENTAL DISABILITIES

It is the responsibility of the student to report in writing any personal restrictions or disabilities that may influence academic performance or human safety. Your written notification should be delivered to the Academic Affairs Manager prior to the end of the first week of Block 1 or within one week of medical diagnosis of any medical restrictions or physical or mental disabilities. If you are requesting specific accommodations based on your restrictions/disability, that request must also be in writing and be accompanied by supporting documentation from a qualified physician/counselor. The college is not obligated to make accommodations for your disabilities if you do not fully inform the college within the above stated timelines. The potential for human injury always exists in the practice of veterinary medicine, and the risk increases whenever an involved person is pregnant or temporarily disabled from any cause, e.g., broken leg, disease. The greatest hazards are accidents that occur while working with animal patients or equipment that result in injury to the student and/or her unborn child. Added hazards in several courses of the veterinary college curriculum include exposure to toxic drugs, infectious agents, inhalation anesthetics, radiation, and other agents. The pregnant/temporarily disabled student should:

1. Contact a physician immediately to get recommendations to minimize exposure to the hazards associated with a veterinary student's assignments.
2. Provide a signed statement (from the physician) defining permitted limits of exposure to possible hazards during pregnancy or period of disability.
3. Inform the Academic Program Director and the Animal Health Center Director of pregnancy or temporary disability as early as possible so that steps may be taken to conform to the plan developed by the physician and to take advantage of available options.

Available Options

1. Withdrawal as a student. It is strongly recommended that the pregnant or temporarily disabled student withdraw until the termination of pregnancy or resolution of the disability. The student could resume classes and graduate at the completion of all senior rotations. This option minimizes the potential for injury and resulting legal actions.

2. Continuation as a regular student with some schedule and assignment changes. This option may delay the time of graduation. This option may have risks. This option is dependent on:

- a. Changes in an individual's schedule of clinical assignments prepared in advance for an entire calendar year.
- b. Permission of the faculty rotation leaders to change the individual's clinical assignments.
- c. Willingness of classmates to exchange scheduled assignments with the pregnant/temporarily disabled student.
- d. Certification by an attending physician of any constraints and of the individual's physical ability to continue full participation in all aspects of the educational program.
- e. A written "hold harmless" agreement signed by both the student and student's spouse/child's father.

Rights and Responsibilities

1. The pregnant/temporarily disabled student has rights and responsibilities for decisions concerning their condition and behavior based on a physician's subsequent assessment of circumstances.
2. The affected student is expected to complete each and every requirement of the veterinary curriculum by a schedule or plan that can be implemented and by which the risks are deemed assumable by the student and his/her attending physician.
3. A faculty member may refuse to allow a pregnant or temporarily disabled student to participate in assignments or activities whenever, in that faculty member's judgment, there exists a high potential for accidents or exposure to hazards.
4. The faculty member may insist under these circumstances that a physician inform the pregnant or temporarily disabled student of the potential hazards.
5. Copies of all documents pertaining to a pregnant/temporarily disabled student's assignment must be maintained in the student's file.

EMERGENCIES

If any person is injured to the extent that he/she cannot be sent to the Student Health Center or the emergency room, the supervisor should:

1. Call 911, if deemed necessary and advise where the injured person is located and give the person's name.
2. Describe extent of the injury or illness.
3. When a supervisor or other responsible person is not available to assist, an injured employee should call or go directly to the Student Health Center. The injured person should notify the Dean's Office immediately or within 24 hours at the latest to complete forms. If he/she leaves his work area to obtain medical treatment, supervisors and the Dean's Office should be informed.

HEALTH INSURANCE POLICY

Health insurance coverage is recommended to protect against injuries associated with your educational experience at the college. Injuries sustained while matriculating as a student cannot be covered by any work-related health/accident insurance obtained through employment at the university.

ANIMAL BITE AND/OR SCRATCH PROCEDURE

1. All bite or scratch wounds that result in bleeding should be scrubbed and cleansed immediately and thoroughly with soap and water. Injuries sustained from a cat or dog should be washed for 15 minutes. First aid kits are available in the area. All bite and scratch wounds should be observed closely. If redness, pain, or swelling occur around the wound, a physician should be consulted.
2. The employee must inform his or her supervisor of the injury as soon as possible after initial first aid is completed. In addition, the injured employee must complete a Report of Injury or Occupational Disease and return it to the Dean's (or other official's) office, as noted above.
3. For any non-emergency injury, if an employee wishes to see a physician, he or she should be encouraged to contact his or her personal physician.
4. A tetanus immunization should be current (within 10 years). If the student's tetanus vaccination program is not current, he or she should receive a tetanus immunization.
5. Random source dog, cat, or wild animal bites need special attention. The employee must inform immediately a facility attending veterinarian as well as his or her supervisor when such a bite has occurred.
6. Bite incidents may require that the animal be placed under quarantine, especially if the animal's vaccination history is unknown.

RABIES PROPHYLAXIS POLICY

The College of Veterinary Medicine requires rabies prophylaxis vaccination series for all DVM students at the student's expense. The Longest Student Health Center offers the vaccination series by appointment. Documentation verifying rabies vaccination series is required prior to registration for fall semester, freshman year and should be delivered or mailed to:

MSU-CVM- Barbara Coats
P. O. Box 6100, Mail Stop 9825
Mississippi State, MS 39762

The only exemption to this requirement will be on written statement from a physician documenting anaphylactic reaction to the specific vaccine or to components of the vaccine.

IMMUNIZATIONS

Mississippi State University requires new students, including transfers, born after 1956, to provide proof of immunity to measles (rubeola) and rubella. You may access the MSU Certificate of Measles/Rubella Immunization Form via the Longest Student Health Center web page.

Print the form, properly complete it, and mail it to:

Student Health Services

J. C. Longest Student Health Center

P. O. Box 6338

Mississippi State, MS 39762-6338

ALLERGIES TO ANIMALS

Allergies to laboratory animals are a common and important occupational health problem for persons who care for or work with animals. Laboratory animals involved: Probably any species can be allergenic. Species most commonly implicated in allergies (percent of total incidents) are: rat; rabbit; guinea pig; mouse; cat; dog; and hamster. Disease in man: Surveys show that allergies occur in 11 to 30 percent of people who have direct contact with animals and occur within 2 years of the first exposure, but the majority of affected individuals develop the symptoms within 6 months of exposure. A previous history of other allergies, such as hay fever, may indicate a greater tendency to develop allergies, but this was not evident in all surveys. Evidence suggests that a history of previous allergies is correlated with the likelihood of severe symptoms (asthma) in individuals who have allergies. Surveys indicated also that more than half the individuals who become allergic to laboratory animals may require treatment or have to stop working, at least for a temporary period.

Signs of allergies may manifest initially as mild upper respiratory difficulties, such as sneezing, conjunctivitis, and rhinitis, and may, on repeated exposure to airborne allergens, progress to more serious lower respiratory symptoms such as asthma. The asthma symptoms usually occur shortly after contact, but they may not occur until hours later when the allergic individual has gone home. Direct skin contact when handling animals may result in wheals, urticaria, and more chronic symptoms such as eczema. The animal allergens can originate from shed dander and hair or can be contained in urine, saliva, serum, or tissues.

Recent studies have shown animal allergens are specific proteins of low molecular weight (17,000-67,000 mwt). Several allergens have been isolated and characterized: mouse albumin, mouse dander allergen, rat urinary protein, cat allergen 1, cat serum albumin, dog serum albumin, and cow dander allergen. Immunologic tests have indicated that each of these is a unique, highly specific allergen with little cross-reactivity.

Diagnosis, control, and prevention: Diagnosis of allergies is based on a detailed history, a physical examination, and a variety of tests. Symptomatic relief can be obtained under the care of a physician, with careful use of antihistamines. Avoiding allergens completely

may be the best way to control laboratory animal allergies. Unfortunately, this is not always possible for people who have made career choices that are hard to change. For these individuals a variety of practices can help reduce contact with the offending allergens. These include the use of masks and other protective clothing, housing animals in filter-top cages, and the use of other filtered and ventilated caging systems, improving ventilation, avoiding recirculation of animal room air, and increasing the frequency of cage cleaning.

INJURIES IN THE WORKPLACE

Most of the health problems occurring in an animal facility involve accidents unrelated directly to animals. These problems are very common, and are prevented by knowledge of dangers, proper cautions, and appropriate signage.

The most common situations that may cause injury are:

1. Falling on slippery floors or off weak or broken supports
2. Lifting items improperly
3. Falling over uneven surfaces
4. Cuts from needles, knives, wires, and other sharp instruments or implements
5. Injuries from operating heavy equipment
6. Burns from flammable or heated materials or steam
7. Exposure to toxic substances, such as anesthetic gases, pesticides, and experimental substances
8. Getting particulate matter in eyes

CHEMICAL HAZARDS

General guidelines for handling chemicals:

1. Store chemicals in a cool, central area.
2. Store volatile chemicals so vapors cannot collect and create a hazard.
3. Dispense cleaning chemicals to those who have been instructed in their use.
4. Follow instructions on the label. Higher use levels are rarely more effective and will probably be hazardous.
5. NEVER use the contents of an unlabeled container. Do not assume you know what is in the container -- it is cheaper to waste the contents than to make a mistake.
6. NEVER mix different chemicals unless the manufacturer or a knowledgeable person authorizes you to do so: Combinations can be ineffective or hazardous. Combining bleach and ammonia, for example, creates noxious fumes.
7. DO NOT REUSE empty containers for a different product. Rinse the container and discard it properly.
8. If chemicals are purchased in bulk containers and must be dispensed into smaller quantities, dispense the chemicals into smaller containers of the same quality as the original containers and that have not been used for storage of another product. All such containers should be labeled permanently.

WASTE ANESTHETIC GASES IN THE WORKPLACE

1. Conflicting evidence exists in the scientific literature about the effects of trace levels of anesthetic gases on the health and performance of operating room personnel. Genetic mutations, cancer, complications during pregnancy (e.g., spontaneous abortions), hepatic and renal disease, immunologic effects, headache, nausea, fatigue, and psychomotor changes have been linked to exposure to trace gases.
2. More recent animal and human studies have failed to provide conclusive evidence of harm, with the exception of nitrous oxide. "Although results from animal studies suggest that an association between exposure to anesthetics and adverse reproductive outcomes may be biologically plausible at high, near-anesthetizing concentrations, the epidemiologic evidence is too weak to conclude that there is a causal association between occupational exposure and developmental and reproductive outcomes." (Meyer, RE. Anesthesia Hazards To Animal Workers. Occupational Medicine: State of the Art Reviews. 1999. 14(2) 225-233.
3. Even though potential for serious effects on human health and performance in the operating room is probably small, if at all, exposure to waste anesthetic gases should be minimized.

HANDLING COMPRESSED GASES

1. Always use a hand truck for transport. Chain the cylinder to hand truck.
2. Do not transport tanks in closed vehicles.
3. Secure cylinders at all times.
4. Do not drop cylinders, or otherwise permit them to strike each other.
5. Leave valve cap on cylinder until the cylinder is secured and ready for use.
6. Electrically ground all cylinders containing flammable gases.
7. Use tanks only in an upright position.
8. Close all valves when the tank is not in actual use.
9. Use the proper regulator for the particular gas.
10. Carefully open valves and adjust gas flow rates.
11. Always consider cylinders to be full and handle accordingly.
12. Discontinue using a high-pressure cylinder when the pressure approaches 30 psi, clearly mark EMPTY, and then remove for return to vendor.
13. Do not use oily (not specially cleaned) fittings with oxygen. Oxygen under pressure will rapidly oxidize oil or grease, resulting in an explosion. Equipment cleaned for oxygen service must be used.
14. Do not pressurize gas equipment. A general rule is no pressure greater than 10 inches of water should be used without special protective equipment.
15. Never mix gases in a cylinder. Explosion, contamination, corrosion, and other hazards can result.
16. Store cylinders containing large amounts of flammable gas (e.g., hydrogen, acetylene,

ethylene) outside in a protected area and piped into the working area.

17. Store tanks in a fire-proof, well-ventilated area.

18. Regulate storage area temperature and not to exceed 100°F.

19. Store gases supporting combustion (e.g., oxygen, chlorine) at least 25 feet from fuel gases, preferably in another gas storage area.

MISCELLANEOUS HAZARDS

1. Bedding Material

Bedding material received at the LARAC units are often contaminated with dust and larger particles that can be inhaled and cause irritation to the respiratory tract. When handling bulk bedding (clean or dirty), wear a particle mask.

2. Loud noises

Constant exposure to loud noises such as barking dogs or squealing pigs may lead to a hearing impairment. To decrease this risk, students present in areas of the facility where loud noises are a hazard should wear protective hearing devices.

HAZARDS ASSOCIATED WITH TYPES OF ANIMALS

Humans usually are not susceptible to the common infectious diseases of most laboratory or farm animals. There are, however, some important exceptions. Infections of animals may, on some occasions, produce significant disease in people. These infections are called zoonotic diseases. They are communicated from animals to humans (or vice versa). In many cases the animals show little, if any, sign of illness. A microorganism in the normal flora of a healthy animal may cause a serious disorder in a person exposed to that organism. While the animals develop “resistance” to these microorganisms, humans with no previous exposure to the agent (or if immunocompromised) lack this protective immunity. Therefore, one should be aware always of possible consequences when working with each type of animal and then take precautions to minimize the risk of infection. In the event that you do become ill with a fever or have some other sign of infection, it is important to let the physician caring for you know of the work you do with animals.

There are common sense steps that can be taken to lessen the risk of infection in general. These include cleanliness in routine tasks conducted around animals and hand washing after completion of animal work. Investigators should protect themselves against contact exposure by wearing gloves; substituting manually operated pipettes for needles and syringes, and cannulae for multiple needle “sticks”; taking enough time to give injections properly; and by using a two-person team to restrain and inoculate animals. Further precaution should be taken by cleansing thoroughly the inoculation site. **Do not recap or bend, clip, or break needles.** Discard needles and other sharps in designated, puncture-resistant containers located as close to their site of use as is practical.

In addition to zoonotic diseases, all personnel should be aware that laboratory animals (particularly rats, rabbits, guinea pigs, hamsters, and cats) are sources of potent allergens to sensitized persons.

Rodents and Rabbits

Practically all rabbits and rodents (and some dogs) are procured from vendors having animal colonies free of human and animal pathogens. After receipt, these animals are usually maintained pathogen-free through use of proper control measures (e.g., quarantine and health monitoring, including laboratory tests). Thus the chance of contracting an infectious disease from a small laboratory animal is small. The most significant hazards associated with these animals are the possibility of developing or exacerbating an allergy (see discussion of laboratory animal allergies) and being bitten or scratched. Contact with rodents requires precautions against such diseases as toxoplasmosis, tapeworm infection, rat bite fever, lymphocytic choriomeningitis (LCM), and salmonellosis, as well as ringworm and other dermatomycoses. Additional concerns for investigators using wild rodents are leptospirosis, hantavirus, and bubonic plague. Attention should also be paid to the possibility of allergic reactions. LCM, a rodent neurologic virus, is transmissible to man. To reduce exposure to LCM, care must be taken when handling rodents as well as potentially infected materials, such as bedding and feces. Wild rabbits can carry tularemia.

Dogs and Cats

These animals are often obtained from sources other than colonies bred for research purposes. Therefore, their health status and history are unknown and their pathogen status must be considered suspect. Because of known serious zoonotic diseases, including rabies, care and discretion must be exercised around these animals. In addition to rabies, cats can transmit toxoplasmosis that can cause birth defects if a pregnant woman is infected early in gestation. The most frequent injuries associated with dogs and cats are bites, scratches, and allergies. Dogs and cats used in long-term studies at Mississippi State are vaccinated against rabies. An exception may be made for those animals used in acute experiments or in surgical practice. Even though those animals are under a veterinarian's supervision, some risk of exposure to rabies exists because the observation period may be too short to allow typical development of the symptoms of the disease to develop. All animal caretakers handling dogs and cats should consider being vaccinated against rabies. Investigators, students, and other staff who come in contact with dogs or cats, particularly animals obtained from pounds, are encouraged to have the pre-exposure rabies prophylaxis. Parasites such as intestinal round and hookworms from dogs, some tapeworms, and sarcoptic mange are a potential risk to persons handling infected animals. Ringworm, a fungus disease of the skin, is also a common infection in cats and is readily transferable to man. Those working with dogs and cats should be conscious of possible allergic reactions.

Cat scratch disease ("cat scratch fever") is a zoonotic infection characterized by regional lymphadenitis following a skin papule at the site of the cat scratch. Although the prognosis is usually excellent and the disease is self-limiting, an examination by a physician is recommended.

Farm Animals

Farm animals, such as cattle, swine, goats, sheep, and poultry, are purchased from varied

sources, usually without complete information on their health and immunization history. This dictates the need for care in handling these animals and taking appropriate measures such as quarantine and isolation to control and identify diseases, especially those transmissible to man. Two common laboratory acquired infections associated with these species are cryptosporidiosis and Q-fever. Q-fever is most commonly associated with sheep and is a particular problem when working with pregnant sheep and newborn lambs. Care must be taken when working with farm animals to avoid contact with urine and feces and bites, scratches, kicks, and sprains. Q-fever, a potentially serious human disease caused by the rickettsia *Coxiella burnetii*, was formerly quite common among people drinking unpasteurized milk and in slaughterhouse workers exposed to the tissues of freshly slaughtered cattle, sheep, and goats. It is now known that the organism is concentrated in and shed abundantly from the placental membranes of sheep. This route of exposure has been the cause of cases of Q-fever pneumonia in laboratory workers. Sheep used in reproductive research or other studies may be examined serologically for possible infection, and personnel working where exposure is possible should take extra precautions. It is recommended strongly that all pregnant ewes be treated as if they were Q-fever positive, and protective measures taken. Gloves, mask, and protective clothing are recommended for individuals working with sheep and goats. Infected persons can be treated effectively with antibiotics. Erysipelas in pigs can be transmitted to man and cause a severe focal skin infection, and pigs showing diagnostic lesions should be handled with care. Similar appearing though less severe skin lesions are also seen on the hands after contact with sheep and goats infected with contagious ecthyma or “orf,” or with vesicular stomatitis. Cryptosporidiosis, a protozoal enteric disease of many animals including man, may affect ruminants and be spread via feces. Rabies can also be a threat in large animals, such as cattle and horses. For workers with cattle or horses, pre-exposure rabies prophylaxis is encouraged.

Feral Animals and Unusual Species

Non-traditional laboratory animals are used sometimes in research. These species may include ferrets, opossums, muskrats, and various amphibians and reptiles. Most such species will be maintained in an isolated, restricted setting with specific safety instructions. Birds can carry diseases such as psittacosis and avian tuberculosis. Only inspected and properly quarantined birds should be used in research studies or teaching demonstrations. Rabies can be a threat in blood-sucking bats. Therefore, personnel working with this species are advised to have the pre-exposure rabies prophylaxis. Salmonella is frequently harbored in turtles and other reptiles and in amphibians. Gloves and good handwashing are always recommended during and after contact with reptiles and amphibians.

The possibility of disease transmission from animals to man is influenced by several factors:

1. The susceptibility of the individual.
2. The length of time the animal is infective.
3. The length of the incubation period in animals. This period is important in some diseases with a long incubation period, because the animals may be used and killed

before the disease becomes infective for humans and before the illness becomes clinically apparent in the animal.

4. The stability of the agent. This is most important in direct transmission, in which the agent is exposed to environmental changes.

5. The population density of animals in the colony.

6. Husbandry practices. Routine maintenance procedures often contribute to the dispersion of infective material. Control of insects and wild rodents is important because vermin may act as vectors.

7. The virulence of the agent and susceptibility of the host.

CONCLUSIONS

The generally low incidence of disease caused by exposure to animals tends to generate a false perspective of their overall significance in animal management. The prevention of one epidemic or even one case of a serious human disease in students justifies a continuous effort expended toward disease control. In the final analysis, the success of a preventive medicine program depends on the cooperation and conscientiousness of each individual toward his/her daily work. An uncompromising attitude toward zoonosis control is the best protection against diseases shared by man and animals.