

Animal Sciences

Animal Exposure Awareness

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The purpose of this awareness publication is to make students aware of the risks associated with handling, feeding, cleaning, exposure to unfixed tissues, or exposure to animal wastes or bodily fluids.

What Are the Risks?

Allergies

Allergic reactions to animals are common and can adversely affect people who are involved in the care and use of laboratory animals. The most common source of animal related allergens are the proteins that are excreted in saliva and urine and from various glands associated with the skin. Allergens are species specific; therefore, it is possible to be allergic, for example, to rabbits but not to mice. People can also become allergic to multiple species. If a person is allergic to one species, the chances of becoming allergic to another species is much greater. Persons with allergies to animals display symptoms ranging from *sneezing, itchy red eyes, hives, asthma, and in severe cases anaphylaxis.*

Action Step

One way to minimize exposure to the allergens that cause allergy symptoms is to make available the appropriate personal protective equipment (PPE), such as filter-type masks, respirators, gloves, and lab coats. This type of personal protective equipment is recommended to individuals working directly with animal bedding, and/or animal waste.

Persons having symptoms of allergies to laboratory animals should consult a physician.

Injuries

Bites, scratches, kicks, slips, and falls are common hazards associated with handling and working with a variety of different species of animals. Handling large domestic animals, such as cattle and horses, can result in crushing injuries should the animal fall, kick or push against its handlers. These types of injuries are *generally* avoided with proper handling techniques, facilities, and awareness of hazards such as wet floors in the immediate environment.

Action Step

Injuries occurring during a class should be reported to the instructor. If medical attention is necessary, students should seek assistance from the Purdue University Student Health Center. In an emergency, transportation can be arranged by contacting the Purdue University Police Department at 911 from a Purdue University phone.

Diseases Communicable From Animals to Humans

Humans are usually not susceptible to infectious diseases occurring in animals. However, there are some important exceptions. Organisms carried by normal-appearing animals may, on some occasions, produce significant disease in people. Such infections, shared by animals and man, are called *zoonoses*. While the animals have natural resistance to these microorganisms, humans with no previous exposure to the agent lack this protective immunity. Therefore, always be aware of possible consequences when

working with each type of animal and take precautions to minimize the risk of infection. In the event that you become ill with a fever or show other sign of infection, let your physician know of the nature of your work with animals. This history of exposure is often critical in the recognition of disease conditions.

Even though the risk is relatively small for individuals to contract a zoonotic disease, there are individual differences in risk factors. That is, some people are more likely than others to get diseases from animals. A person's age and health status may affect their immune system, and thereby increase his or her chances of getting a disease from animals.

Common sense practices can lessen the risk of infection in general. These include cleanliness in routine tasks around animals and hand washing after completion of animal work. It is recommended that gloves be worn when giving inoculations to protect against accidental self-inoculation. Take enough time to give injections properly. Use a two-person team to inject animals, if necessary. Do not re-cap needles; discard them in a container designed for proper disposal of contaminated "sharps." For procedures such as necropsy, bedding changes, and tissue and fluid sampling, use biological safety cabinets, physical containment devices, or other personal safety gear when appropriate.

The scope of possible zoonotic infections is quite large and only a few examples will be described here.

If You Are Pregnant

Pregnant women without immunity to toxoplasmosis should not be exposed to experimentally infected animals and should avoid contact with cat feces because of the risk of congenital *Toxoplasma* infection. Wear gloves when working in areas potentially contaminated with cat feces or fresh necropsy specimens, which also can contain infectious *Toxoplasma* organisms. Wash hands thoroughly after handling any potential source of infection.

Coxiella burnetii, a rickettsial organism and the cause of Q fever in humans, can infect sheep, cattle, goats, and cats. This rickettsia has a predilection for the uterus and mammary glands of these animals and can be found in birthing products and raw milk. Q fever can cause pneumonia, fetal death, hepatitis, and chronic endocarditis. Pregnant women should minimize exposure to uterine and placental discharges, especially those of sheep. Dusty situations can aerosolize this resistant organism making exposure

without animal contact possible in areas of high sheep density.

Another zoonotic organism of importance to pregnant women is the bacterium *Listeria monocytogenes*. Pregnant women are more likely to contract listeriosis than other healthy adults. The organism is found in soil, water, and manure. Infected animals can carry the organism without appearing ill. The bacterium can be found in a variety of raw foods such as uncooked meats and vegetables or in processed foods that are contaminated after processing such as deli cheeses and meats. Complete washing of fresh vegetables and fruits and thorough cooking of all food along with washing hands frequently will help reduce the likelihood of infection.

In rare cases, pregnant women have contracted *Chlamydia psittaci* from psittacine birds or from exposure to birth fluids or membranes of sheep or goats. This exposure can result in gestational psittacosis and subsequent pneumonia, sepsis, and placental insufficiency. Pregnant women should not be exposed to sheep, goats, or psittacine birds of unknown or positive *Chlamydia psittaci* status.

If You Handle Dogs or Cats

Dogs and cats used at Purdue University are vaccinated against rabies. Nevertheless, some risk of rabies exposure exists because the observation period may be too short to allow typical signs of the disease to develop in the animal. Individuals (this would include pregnant women) working with random source dogs and cats should be vaccinated against rabies and have regular titer checks.

Parasite infections such as visceral larval migrans, some tapeworm infections, and sarcoptic mange, are a potential risk to those handling dogs and cats. Bite wound infections and ringworm (a fungal disease of the skin) are also sources of potential risks.

Cat scratch disease is a zoonotic infection characterized by inflammation of regional lymph nodes that follows the formation of a skin papule in the site of a cat scratch or bite. While the prognosis usually is excellent and the disease in most cases is self-limiting, an examination by an occupation health physician is recommended.

If You Are Handling Farm Animals

Q fever, a potentially serious human disease caused by the rickettsia *Coxiella burnetii*, was formerly quite common in those 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 shed abundantly from the placental membranes of sheep. This route of exposure has caused Q fever pneumonia in laboratory workers. Personnel working with sheep used in reproductive research or other studies should take extra precautions. A history of exposure to sheep, goats, or cattle is important in establishing the diagnosis. Infected persons can be treated effectively with antibiotics.

Erysipelas in pigs can be transmitted as a severe focal skin infection to man, and pigs showing characteristic lesions should be handled with care. Similarly appearing, though less severe, skin lesions also are seen, especially on the hands, after contact with sheep and goats infected with contagious ecthyma (“orf”) and vesicular stomatitis.

Rabies also can be a threat in large animals such as cattle, horses, and pigs.

If You Handle Birds or Reptiles

Unusual research species pose other risks. Birds can carry diseases such as psittacosis, avian tuberculosis, cryptococcosis, or Newcastle disease. Only inspected and properly quarantined birds should be used in research studies or teaching demonstrations. Reptiles frequently are asymptomatic carriers of *Salmonella*.

If You Handle Rodents

(e.g., mice, rats, guinea pigs, hamsters, gerbils)

Contact with rodents requires precautions against such diseases as tapeworm infection, lymphocytic choriomeningitis, rat-bite fever, and ringworm. Additional concerns for individuals exposed to wild rodents are bubonic plague (particularly in certain geographic areas), toxoplasmosis, leptospirosis and Hantavirus.

Lymphocytic choriomeningitis, a rodent neurologic virus, is transmissible to man. Be especially careful when handling rodents as well as potentially infected materials, such as bedding, feces, or rodent derived tissues or cell cultures.

If You Handle Hazardous Agents

There should be methods for monitoring exposure to potentially hazardous agents in the laboratory. Use protective devices when possible and adopt other safety practices consistent with current guidelines. Potentially hazardous chemicals in the animal laboratory include disinfectants, cleaning agents, or pesticides as well as substances utilized in experiments.

Wash hands after handling chemicals, infectious materials, or animals. Generally, use a biological safety cabinet when handling infectious materials and a fume hood when handling toxic materials. Decontaminate all work surfaces daily, as well as all infectious materials or equipment before disposal or reuse, either by autoclaving or chemical disinfectant.

For further information on working with hazardous agents, contact Radiological and Environmental Management (REM) at 46371.

Additional Information

Allergies- <http://www.cdc.gov/niosh/animalrt.html>

Center for Disease Control (http://www.cdc.gov/healthypets/browse_by_animal.htm) has a list for Birds, Cats, Dogs, Farm Animals, Fish, Horses, Reptiles, Wildlife and Pocket pets.

Laboratory Animal Program – <http://www.purdue.edu/research/vpr/compliance/animals>

Radiological & Environmental Management – <http://www.purdue.edu/rem/Welcome.html>

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