

**Occupational Health Program
For the University of Notre Dame's
Institutional Animal Care and Use Committee and
Freimann Life Science Center**

Health Issue Summary: Animal Allergies

Background

Laboratory animal allergy (LAA) is the most common occupational health problem of those exposed to research animals. The specific allergen varies to some extent with the species. For example, urinary proteins, particularly prealbumin, are significant allergens in rats and mice. The urine, fur, saliva, and dander of rabbits and cats are all significant sources of allergens. Symptoms may begin between one month and several years after first exposure to the animals, with a mean interval of 2-3 years.

The most common symptoms of LAA are rhinitis (runny nose), conjunctivitis, and contact urticaria (redness and blistering at the site of animal contact) which develop following the handling of animals or their wastes, or by simple respiratory exposure when in their presence. Thus, individuals may show symptoms of allergy not only after handling animals, but even by simply walking into or past a room housing animals, or even by secondary exposure such as wearing the lab coat of someone who has recently handled animals.

LAA may progress to asthma, a more serious type of allergic reaction. Asthma is characterized by narrowing of the bronchi (respiratory passages), thus making breathing difficult. In this regard, asthma is a severe, even life-threatening condition and consultation of a physician should be sought if symptoms occur.

Clearly, LAA is a common and significant occupational risk to those exposed to animals. Personnel should consider the following information to reduce exposure and therefore risk to harmful allergens.

Recommendations

The overall approach to dealing with LAA should be to minimize the exposure to allergens. In this regard, several procedures are useful:

1. Always wear a surgical-type filter mask over the nose and mouth when working with animals, bedding, or animal waste. A disposable respirator (N95 mask) or fitted respirator offers an even higher level of protection and should be considered.
2. Gloves should always be worn when handling animals, bedding, or animal waste. This will minimize the likelihood of contact allergy. In this regard, a long-sleeve lab coat should also be worn.
3. Individuals demonstrating signs suggestive of LAA should cease handling of animals, bedding, or animal wastes and consult with a physician.

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Health Issue Summary: Zoonotic Diseases

Background

Humans are not always susceptible to infectious diseases of animals. However, there are some important exceptions where infectious agents of animals can produce significant disease in humans. These infections are called **zoonotic diseases**. In many cases, the animals show little, if any, signs of disease. Therefore, one should always be aware 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 become ill with a fever or 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 several easy, common-sense methods that can be taken to lessen the risk of infection with zoonotic agents. These include:

1. Always wear disposable gloves and particulate filter mask (or disposable/fitted respirator) when working with animals or animal tissues/fluids.
2. Always wash your hands with soap and water after handling animals or animal tissues/fluids.
3. When injecting animals with substances, use a two-person team - one individual to restrain the animal, and the other to safely inject the animal.
4. Discard needles and other sharp objects (including broken glass) into designated puncture-resistant "sharps" containers. **Do not recap needles**; rather, dispose of needles uncapped, directly into the sharps container or use a mechanical barrier system to prevent needle stick injuries.
5. For procedures such as necropsy, cage cleaning, and tissue and fluid sampling, use containment devices such as biological safety cabinets (when possible), face shields, particulate filter masks or disposable/fitted respirators, and other personal protective equipment as indicated by the situation.

Pregnant individuals may be at particular risk when working with animals or animal tissue/fluids. For example; *Toxoplasma gondii* is an infectious agent found primarily in cat feces. It can infect the unborn baby in women exposed during pregnancy. For this reason, cat feces should be avoided and gloves and mask worn when working in potentially infected areas. In addition, working with hazardous agents in general and toxic chemicals in particular is discouraged during the first trimester of pregnancy. The Occupational Health Program physician for Notre Dame at The Notre Dame Wellness Center can be contacted at (574) 634-WELL (9355).

Species- Specific Zoonotic Concerns

Non-Human Primates

Non-human primates pose a number of zoonotic risks. For example, the Tuberculosis bacterium may be transmitted both from animals to man and from man to animals. In all non-human primate colonies, regularly scheduled TB testing of the animals and the personnel must be done. Common human viruses such as measles and *Herpes simplex* may also pose particular risks for some non-human primates. *Cercopithicine Herpesvirus*

or “Herpes B”, is carried by Old World primates (especially macaques). It is the non-human primate virus of most concern to people who handle these animals. The virus is often carried asymptotically by monkeys, but some times ulcers on the tongue and lips can be seen. Humans are exposed through contact with the saliva, blood, urine, and possibly the feces of monkeys. Thus, anyone who is bitten or splashed with urine or other body fluids or experiences a puncture wound with an object that has been exposed to a monkey, is at risk. Initially, symptoms are flu-like, with muscle aches, fever, and lethargy being common. The disease progresses rapidly to an often-fatal encephalitis.

Non-human primates often carry gastrointestinal bacteria and parasites that pose a risk to man. For example, *Shigella*, *Campylobacter*, and *Salmonella* are bacteria that can cause dysentery in both non-human primates and man. Parasites such as *Entamoeba histolytica* can also be transferred to man and provide further reason for careful hand washing after exposure to primate feces.

Protective clothing such as outer garments, gloves, masks, and face shields must be worn when handling non-human primates. More detailed procedures are available from the Freimann Life Science Center office (1-6085).

Birds, Rabbits, Reptiles, and Amphibians

Unusual research species also carry zoonotic risk. Birds have diseases such as psittacosis and avian tuberculosis which can be transmitted to man. Only birds which have undergone an appropriate quarantine should be used in research or teaching.

Rabbits pose few risks of infectious disease. Although some rabbits carry the bacteria, *Pasturella multocida*, the rabbits at FLSC are tested to be free of these bacteria. In addition, no human cases of Pasturellosis attributed to contact with rabbits have been documented. Those working with rabbits should be aware, however, of possible allergy to the dander of rabbits.

Salmonella is a bacterium that may be harbored in birds, reptiles and amphibians. In humans, infection may result in mild to severe, chronic diarrhea. For this reason, gloves should always be worn when handling animals and hands washed with an antiseptic soap after handling.

Fish and Aquatics

There are no reported parasitic, viral or fungal zoonoses that are derived from aquatic species exclusively through handling. Bacteria are the primary causative agents for zoonoses. These agents include *Aeromonas*, *Vibrio*, *Edwardsiella*, *Escherichia*, *Salmonella*, and *Klebsiella* ssp. of gram-negative bacteria. Additionally, aquatic *Mycobacterium* ssp, *Streptococcus iniae*, and *Erysipelothrix rhusiopathiae* are gram-positive bacteria implicated as zoonotic agents. In all cases the primary route of infection is through puncture wounds and contamination of existing abrasions and cuts.

The severity of disease varies from localized wound swelling from *Aeromonas*, *Vibrio*, and granulomatous nodules from *Mycobacterium* ssp, and necrotic lesions from *Edwardsiella*, *Escherichia*, *Salmonella*, and *Klebsiella* ssp to systemic arthritis, endocarditis and meningitis from *Streptococcus iniae* and *Erysipelothrix rhusiopathiae*.

The most effective way to prevent infections is to minimize direct contact with fish and their water. Because it is likely that contact with the fish, water or both will occur during the course of the experiments, basic hygiene measures need to be taken. Wearing vinyl, latex, or nitrile gloves will reduce exposure of cuts and abrasions on the hands. Canvas or heavy gloves worn over water-proof gloves will protect against cuts from fins or spines. When contact occurs, thorough hand washing is essential. All wounds from fish should be reported and appropriate first aid administered. Gloves should always be worn when cleaning tanks and equipment. *

Rodents

Contact with rodents requires taking precautions against such diseases as Toxoplasmosis, tapeworm infection, Lymphocytic Choriomeningitis (LCM), and Salmonellosis. While most of the rodents used in the FLSC are purchased to be free of these pathogens, it is possible for infections to occur. Of course, wild rodents are at a much greater likelihood of carrying such agents, thus personnel participating in studies using wild-caught animals should be particularly diligent in taking precautions. As with other species, personnel should wear gloves and a particulate filter face mask or disposable/fitted respirator when handling these animals or their tissues. In addition, personnel should thoroughly wash their hands with an antiseptic soap after handling animals.

Risk of bite wounds, and to a lesser extent scratch wounds, exists when handling rodents. Such wounds should be thoroughly washed with an antiseptic soap. Signs of infection such as redness, swelling, and warmth of the wound site, or discharge from the site should be reported to the employee's supervisor and to a physician if noted. Typically such signs might be seen within 24-72 hours after the injury. With some rodents, particularly rats, bite wounds may become infected with either *Streptobacillus moniformis* or *Spirillum minus*, bacteria which may cause "rat bite fever" in man. This disease is characterized by fever, headache, nausea, joint pain, and an erythematous rash on the hands and feet. Severe cases may progress to enlargement of the lymph nodes and endocarditis. The disease can be effectively treated with penicillin under the oversight of a physician.

Summary

A number of zoonotic agents are associated with species used at the FLSC. For this reason, personnel working directly with such animals or with tissues or fluids derived from them should take the precautions described above.

For further information, personnel may contact the Director or Associate Director of FLSC at 1-6085 or the Occupational Health Program physician for UND at (574) 634-WELL (9355).

* Lowry, T., Smith, S.A. Aquatic zoonoses associated with food, bait, ornamental, and tropical fish, JAVMA, Vol 231, No.6, pp876-880

MAS 3/00, 1/08, 6/08, 7/15 VAS

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Health Issue Summary: Miscellaneous Hazards

Background

When thinking of occupational health issues that affect users of animals and their tissues, one typically considers those of an infectious nature or those related to allergic reactions. Yet, animal facilities and the types of procedures generally conducted may expose personnel to additional risks that need to be addressed. These risks include those related to chemical, radiological, and physical hazards.

Radiological Hazards

Studies involving the use of radioisotopes in animals are sometimes conducted at the FLSC. Under such circumstances, studies must be carried out, and materials handled in accordance with the requirements of the Nuclear Regulatory Commission (NRC). For example, specific procedures should be developed for administration of radioisotopes to animals, housing of animals, and disposal of wastes. Any such use of animals may be conducted only after approval from the Risk Management and Safety office (1-5037).

Chemical Hazards

Studies involving hazardous chemicals are sometimes conducted in animals in FLSC. It is important that all involved, including the principal investigator, laboratory personnel and FLSC staff are all aware of the hazardous agent being used and procedures to safely work with the chemical, the exposed animals, and animal wastes. The principal investigator should contact the Risk Management and Safety office (1-5037) and FLSC (1-6085) to develop appropriate handling procedures. Once procedures have been developed, all personnel with potential exposure to the chemical, the exposed animals and their wastes should be provided this specific information.

Animal facilities such as the FLSC also generally have additional chemical hazards associated with disinfection procedures. Many of the chemicals used in disinfection of cages are toxic and/or irritating. Personnel handling these agents should wear goggles or a full face shield, nitrile or neoprene gloves, and a lab coat/garment which covers the arms or a rubberized apron. Contact with disinfectant chemicals may result in chemical burns or hypersensitivity reactions. Affected individuals should contact their supervisor and consult the SDS binders (located in the FLSC hallway next to the employee break room, in the basement hall near room 514, or in RCH next to room 013 in the hallway), for specific recommendations to effectively deal with the exposure.

Physical Hazards

Work within a typical animal facility exposes personnel to various types of physical hazard risks. Some of these hazards with the appropriate protective steps include:

1. Thermal hazards - High temperatures are generated by equipment including cage washers, autoclaves, and glass-bead sterilizers for surgical instruments. When near such equipment, personnel should take precautions to avoid direct contact with heated materials. For example, insulated gloves should be worn when removing items from the autoclave. The use of liquid nitrogen or dry ice can be a potential thermal hazard as well. The use of insulated cryogloves is recommended. Individuals suffering a thermal burn should contact their supervisor and the FLSC Technical Services and Training Coordinator (1-6087) for appropriate action.

2. Sharps hazard - Risk of puncture injury exists from a variety of objects, including broken glass, scalpel blades, hypodermic needles and glass Pasteur pipettes. To minimize this risk, sharp objects should be disposed of into designated puncture-resistant containers. **Do not recap needles**; rather, dispose of needles uncapped, directly into the sharps container or use a mechanical barrier system to prevent needle stick injuries. Needlestick injuries are an OSHA reportable event and **MUST** be reported to your supervisor and the FLSC Technical Services and Training Coordinator (1-6087) for appropriate action.

3. Ergonomic hazards - Ergonomic hazards exist such as those from injuries incurred during lifting or from repetitive motions. Individuals desiring aid devices to help reduce the risk of such injuries, such as back braces or wrist braces, should contact the FLSC office (1-6085) or the Risk Management and Safety office (1-5037).

4. Auditory hazards - Significant noise is generated by certain equipment within the typical animal facility. For example, the operation of cage washers generates noise levels which could be injurious. For this reason, individuals should wear hearing protection when exposed to this equipment. Ear plugs are available in the west-side (clean) cage wash area.

Summary

A number of significant risks exist within animal facilities such as FLSC. Simple precautions to minimize the risk should be taken by personnel. In all cases, if questions or concerns arise, personnel should contact the Director or Associate Director of FLSC (1-6085) or the Risk Management and Safety office (1-5037).