

Working Safely with Laboratory Birds: Preventing Injury and Zoonotic Disease Transmission

The VSU IACUC occupational health and safety program is designed to inform individuals who work with animals about potential zoonoses (diseases transmitted to humans from animals), personal hygiene to prevent zoonotic transmission, and other potential hazards associated with animal exposure. This information sheet is directed toward those involved in the care and use of laboratory birds.

Injuries from Handling Birds

Scratches and puncture wounds can be inflicted by birds in the laboratory or the field. People who handle birds for research or teaching should be provided with training in proper handling techniques to avoid injury to themselves or the animals, such as specific handling and restraint techniques and protective clothing requirements.

Potential Zoonotic Diseases

Birds can carry organisms that may be potentially infectious to humans. Bird colonies in the laboratory setting are normally closely managed to produce high quality, healthy animal models. The likelihood of a person contracting a disease from a bird is very low. However, there is always a risk of an outbreak occurring within a colony, either from a new bird being introduced into an established colony or from individuals inadvertently contaminating a colony by wearing shoes or clothing that have been in contact with asymptomatic disease-carrying birds. A disease, such as *psittacosis*, is infectious both to other birds and to people. Therefore, an outbreak within a colony could significantly increase the risk of human exposure.

Psittacosis (Ornithosis, Chlamydiosis): Psittacosis is a disease caused by the bacteria, *Chlamydia psittaci*. Psittacosis is common in wild birds of all types and can occur in laboratory bird colonies as well. The reservoir/source of infection to people is infected birds, especially ones displaying symptoms (diarrhea, respiratory signs, conjunctivitis and nasal discharge.) This disease is highly contagious to other birds as well as humans. Transmission may be through direct contact or from aerosolization with exudative materials (e.g., pus), secretions, feces, feather dust, or contaminated soil. **Direct contact with the bird is not necessary.** In people, the disease occurs seven to fourteen days after exposure. An infected human may develop symptoms in varying degree, from flu-like symptoms in mild cases to lymphadenitis, pulmonary disease similar to tuberculosis, extensive interstitial pneumonia and rarely hepatitis, myocarditis, thrombophlebitis, and encephalitis in more serious cases. Infection in pregnant women has been associated with infectious abortion. Psittacosis is responsive to antibiotic therapy. Relapses occur if left untreated.

Salmonellosis: Salmonellosis is a disease caused by the bacteria species *Salmonella*. It is one of the most common zoonotic diseases in humans. Birds (and reptiles, especially iguanas) are the animals most frequently associated with *Salmonella*. Most people typically contract the disease by consuming food or water contaminated with the bacteria or by consumption of undercooked meat and egg products from infected birds. Birds infected with this disease may have diarrhea and discolored droppings, but some birds may show no symptoms of disease. Free-ranging or wild-

caught animals are more likely to carry this infection than those raised and housed in a laboratory setting. Symptoms in humans include diarrhea (usually watery and occasionally bloody), nausea, vomiting, fever, chills, and abdominal cramps. If the bacteria leaves the blood stream and enters the central nervous system, meningitis/encephalitis may develop. Salmonellosis is a very serious disease in humans, especially for young children and people with compromised immune systems.

Newcastle disease: Newcastle disease is a serious and fatal viral disease in avian species. Velogenic Newcastle disease is a potential threat in birds found in foreign countries but is not currently present in bird populations in the United States. Affected birds may demonstrate neurological signs that progress to death. Definitive diagnosis is through viral isolation of the organism. The disease is quite contagious among birds and has zoonotic potential that often may go unrecognized. Clinical signs in people most commonly involve a mild conjunctivitis, which is self-limiting.

Avian Tuberculosis: *Mycobacterium avian* (and possibly other species) is a causative agent of tuberculosis. Affected birds may carry the disease for years and intermittently shed organisms. Transmission of MAC occurs primarily through aerosolization and inhalation of the agent in dried bird droppings and contaminated soil. Humans are more commonly infected with *M. tuberculosis* and occasionally *M. bovis*. It is believed that immunocompetent humans are resistant to the strains of tuberculosis found in birds, but immunocompromised people, such as those infected with HIV, those undergoing chemotherapy treatment, the elderly, and children, are at increased risk. In adults, tuberculosis frequently affects the lungs, producing respiratory signs.

Erysipelas: Erysipelas is a bacterial infection of chickens that is transmitted through direct contact with animals, tissues and droppings. The risk of infection increases if persons have unprotected cuts or abrasions on their hands. Disease in humans may present as cellulitis, bacteremia, endocarditis, encephalitis and arthritis.

Cryptococcus neoformans fungal infection: *Cryptococcus neoformans* is a fungus frequently found in pigeon droppings and in soil in many parts of the world. Disease in humans usually presents as chronic meningitis; infection of the lungs, kidneys, prostate and bone may also occur. Immunodeficient persons have increased susceptibility to cryptococcosis and should consult with their health care provider before working with birds.

West Nile virus: Western equine encephalitis virus and other related arboviruses do infect poultry and other birds, but transmission to people is via the bite of an infected mosquito and not by contact with infected birds.

Avian influenza: Avian influenza is a potential threat in birds found in foreign countries but is not currently present in bird populations in the United States.

Other Bacterial Diseases: Cryptosporidiosis and Campylobacteriosis may be acquired by contact and accidental ingestion of fecal material or from consumption of undercooked meat and egg products from infected birds. Birds infected with these diseases may have diarrhea and discolored droppings but some birds may show no symptoms of disease. Free-ranging or wild-caught animals are more likely to carry these infections than those raised and housed in a laboratory setting.

Allergic Reactions to Birds

Various bird proteins have been identified as sources of antigens involved in both allergic reactions and hypersensitivity pneumonitis. Hypersensitivity pneumonitis is a lung condition with symptoms that mimic pneumonia. Symptoms develop after repeated exposure to a specific antigen. Signs of an allergic reaction after exposure to birds are rhinitis and asthma symptoms (wheezing and dry cough). Signs and symptoms of both allergic reactions and hypersensitivity pneumonitis usually occur several hours after exposure. To reduce exposure, perform procedures in a laminar flow hood whenever possible.

How to Protect Yourself

Wash your Hands: The single most effective preventative measure that you can take is thorough, regular hand washing. You should wash your hands and arms after handling birds or contaminated cages or materials. Proper technique involves the following steps:

- Wet your hands with clean running water (warm or cold) and apply soap.
- Rub your hands together to make a lather and scrub them well; be sure to scrub the backs of your hands, between your fingers, under your nails, and up your forearms.
- Continue rubbing your hands and arms for at least twenty seconds (the time it takes to sing the "Happy Birthday" song from beginning to end twice).
- Rinse your hands and arms well under running water.
- Dry your hands and arms using a clean towel or air dry.

Washing hands with soap and water is the best way to reduce the number of germs on them. If soap and water are not available, use an alcohol-based hand sanitizer that contains at least 60% alcohol. Alcohol-based hand sanitizers can quickly reduce the number of germs on hands in some situations, but sanitizers do **not** eliminate all types of germs. To use hand sanitizer effectively:

- Apply the product to the palm of one hand (read the label to learn the correct amount).
- Rub your hands together.
- Rub the product over all surfaces of your hands and fingers and up your forearms until they are dry.

Note that hand sanitizers may not be as effective when hands are visibly dirty.

Wear Personal Protective Equipment (PPE): When working with birds wear appropriate gloves for the task and wash your hands after removing gloves. Wear a dust mask or respirator when there is a risk of aerosol transmission of a zoonotic agent or when there is a medical history of allergies. The Office of Environmental & Occupational Safety (OEOS) will assist with respirator requirements. Wear dedicated protective clothing such as an apron or lab coat when handling animals and cleaning their cages. Launder soiled clothing separately from your personal clothes.

Practice Good Hygiene: Cover abraded skin, cuts, scrapes or sores and do not allow wound contact with birds, tissues or fluids, or contaminated housing materials. Avoid touching your face, eyes, nose, or mouth with unwashed hands or contaminated gloves. Never eat, drink, use tobacco products, or apply makeup in animal facilities or while handling animals.

Maintain the Work Environment: Keep animal areas clean and disinfect equipment after using it on animals or in animal areas. Use cleaning techniques that do not aerosolize contaminated materials.

Seek Medical Attention Promptly: If you are injured on the job when handling birds or contaminated materials, promptly report the accident to your supervisor, even if it seems relatively minor. Clean any minor cut or abrasion immediately with antibacterial soap, and protect it from dirt and animal secretions until it has healed. Seek medical assessment and referral for treatment for more serious injuries or if you have an infected wound indicated by swelling, redness, pain, and draining fluids with or without a fever.

Tell Your Health Care Provider You Work with Birds: Familiarize yourself about the animals that you will be working with and the potential zoonotic diseases associated with each species. If you are ill, even if you are not certain that the illness is work related, always mention to your health care provider that you work with birds. Many zoonotic diseases have flu-like symptoms and would not normally be suspected. Your health care provider needs this information to make an accurate diagnosis. Questions about personal human health should be answered by your health care provider.