



OCCUPATIONAL HEALTH EDUCATION PACKET

REVIEW OF INFORMATION ARTICLES CHECK LIST

ALL personnel currently working on approved projects must review the attached materials and return the completed and signed **checklist** to the IACUC. The first page (checklist only) should be sent electronically to iacuc@research.buffalo.edu or it can mailed to the IACUC at: Office of Research Compliance, Clinical and Translational Research Center, 875 Ellicott St., Room 5018, Buffalo, NY 14203.

Please check off the following articles after you have finished reading them:

	Information on Allergies
	Zoonotic Diseases
	Exposure Prevention and Protection
	Reporting Injuries That Occur When Working with Laboratory Animals
	Fact Sheet on Hepatitis Vaccine
	Fact Sheet on Rabies Vaccine

I certify that I have read and understand the above information and Standard Operating Procedures (SOP):

Print Name:		Signature:	
Department:		Date:	
Supervisor's Name:			

NOTE: If you are a principal investigator, each of your staff must read the attached information and sign his/her own individual check off list indicating that he/she has understood the above articles and SOP's. You may duplicate this form and the attached information, or copies are available on the IACUC web site <http://www.research.buffalo.edu/iacuc/>

Occupational Health and Safety in Biomedical Research

Personal health and safety in biomedical research can be impaired through contact with hazardous materials and environments, and through contact with animals or animal products. This section will focus on the potential role that animals and animal products can play in causing human morbidity and mortality.

Purpose of Occupational Health and Safety (OHS) Program is to:

- Make you aware of health hazards
- Minimize your risks
- Provide steps to ensure your own safety

Allergies

Allergy to animals is common and therefore one of the most important occupational problems occurring in workers exposed to animals. Allergies can be manifested in a number of ways, including allergic rhinitis (a condition characterized by runny nose and sneezing similar to hay fever); by allergic conjunctivitis (irritation and tearing of the eyes); by asthma; or by atopic dermatitis (a skin condition which is caused by contact with a substance to which an individual is allergic). Allergy to animals is particularly common in workers exposed to animals such as rabbits, mice, rats, gerbils, and guinea pigs. Exposure to proteins in animal urine, saliva and fecal matter is responsible for the cause of the allergy. Albumin from mouse skin extracts and a component of the murine major urinary protein complex have been found to be highly allergenic. Exposure to animal urine may occur either through direct urine contact with skin, nails, or more commonly by inhaling dust from the bottom of a cage which has been contaminated with urine or fecal matter.

Various studies show that between 15%-20% of workers exposed to animals, will develop some symptoms of allergy. This percentage may be even higher, since some people are forced to leave their jobs because of the severity of the allergies that develop. Most of these reactions are of the allergic rhinitis and allergic conjunctivitis type. Less than half of these will actually be asthma.

People who have a prior personal history or family history of asthma, hay fever, or eczema will be more likely to develop asthma after contact with animals, but these people do not seem any more likely to develop rhinitis and conjunctivitis than do people without such personal or family history. Because of this, it is necessary that everyone exercise certain precautions to attempt to prevent animal allergy. These attempts should not be focused only on people with atopic history. Symptoms can develop anywhere from months to years after a person begins working with animals. A majority of the individuals who are going to develop symptoms will do so within the first year. Certain procedures should be routinely followed in order to prevent the development of animal allergy. Animals should be worked with in extremely well ventilated areas to prevent buildup of various particles in the air. It is recommended that workers wear gloves and laboratory coats to prevent direct exposure to the animals. This applies to animal urine as well as to animal dander. In order to prevent inhaling contaminated materials, cages should be changed frequently and masks should be worn during the changing of cages. Dirty cages should be processed under a HEPA filtered dump station in the cagewash room.

Despite the best preventive techniques, some individuals will develop allergies after contact with laboratory animals. Rarely, this will be so severe that a person is forced to change his/her line of work. More commonly, this can be controlled with the increased use of N-95 respirators while working with animals and the possible use of antihistamine medications. Stations stocked with supplies of respirators, gloves, and gowns etc are located on every floor throughout the Comparative Medicine/Laboratory Animal Facilities (CMLAF). Desensitization therapy has been done for some individuals, but this is not as effective for animal allergies as it is for some other types of allergies. Certainly anyone that develops signs of allergies should seek medical advice.

Symptoms

Rhino-conjunctivitis (sneezing, nasal discharge, red and itchy eyes) is most frequently seen. Hypersensitivity reactions include nasal congestion, rhinorrhea, sneezing, itching eyes, angioedema, asthma, localized urticaria and

eczema. Skin irritation, bronchial irritation, asthma-like conditions and anaphylaxis have also been recorded.

Precautions

Protective clothing can minimize contamination with allergens and thus decrease the chance of sensitization. Gloves, gowns, shoe covers and N-95 Respirators will assist in minimizing exposure. Washing hands after touching animals or their bedding is essential prior to leaving the animal holding rooms. However, none of these measures will completely protect highly sensitized individuals. The latter group can be identified using serological testing, and usually require backpack respirators to work in animal environments. Avoidance of allergens, decreasing allergen contact and exposure time, increasing room humidity levels, use of fume hoods and filter tops on cages, use of protective clothing, removing contaminated clothing, and showering before going home, all reduce exposure.

Animal-Human Disease Transmission

Zoonoses refers to diseases that are transferred directly from an animal to a human, where the animal acts as the intermediate host or vector. Since wild animals often play a central role in the transmission of the disease, the risk for zoonotic disease is low for individuals who work in a modern laboratory animal facilities and have direct contact with laboratory animals. However, individuals who are exposed to laboratory animals must understand that there is always a potential for these diseases to occur.

This section reviews selected known or potential zoonotic agents that have occurred in individuals who work with laboratory animals. In no way does this chapter include all infections or diseases that are zoonotic. The selection included has been made from those that are of principal interest, and apply to those species housed within the CMLAF. The number of listed zoonoses increases with our expansion of biomedical knowledge, improved diagnostic competency, and improved health services. This simply serves as an introduction to the topic of zoonotic diseases.

Zoonotic disease is generally regarded as disease that is transmitted from animals to humans. There are a myriad of animal diseases which, given the right conditions, could transmit to humans. Statistically, transmission of zoonotic disease in the laboratory animal environment is uncommon, but there can be severe consequences. Thus the more usual or more harmful transmissible diseases will be covered in this section. In addition, following good principles for hygiene such as wearing gloves when handling animals, wearing a lab coat in the animal facility and washing your hands after working with animals are important preventative measures.

Rabies

Rabies is a usually fatal disease caused by a Rhabdovirus. It is globally distributed and infects most warm blooded animals.

Transmission

Infection is usually through a bite or abrasion laden with infected saliva. Aerosol transmission has been documented in bats. The incubation period varies within and between species and can be months.

Symptoms in Animals

This varies with the species. Animals may show subtle behavioral change before becoming dull and depressed, or aggressive. Irrational behavior, such as a total and sudden loss of fear of humans, salivation, or hindleg weakness is often a diagnostic sign.

Symptoms in Humans

Rabies virus causes a fatal acute encephalomyelitis. Usually there is a history of a bite or scratch. The site becomes very painful and then highly sensitive. Attempts to drink cause laryngeal spasm, and thus there is a refusal to drink. Restlessness and muscle spasms are followed by convulsions and death.

Prevention

Rabies Vaccination for at risk personnel. Vigorous wound-care for bites & scratches is crucial! Rabies post-exposure prophylaxis treatments.

New Castle Disease

Highly pathogenic strains are excluded from the poultry flocks and birds in the US, however moderately pathogenic strains do exist in flocks. Virus causes inappetence, respiratory disease and neurological disease in birds.

Symptoms in Humans

Can cause conjunctivitis which resolves without complications or see mild fever, respiratory disease leading to cough, bronchitis, & pneumonia.

Influenzae Virus

Humans are the reservoir for human influenza virus infections. New human strains develop by passage of avian influenza viruses through pigs. Ferrets are highly susceptible to human influenza. Naturally occurring in many animals: birds, swine, horses, ferrets, mink, and seals.

Transmission

Airborne & direct contact transmission. Pigs & ferrets can transmit the disease to humans. Humans can transmit flu to ferrets and swine.

Symptoms in Humans

Fever, headache, weakness, prostration, sore throat, cough, nausea, vomiting, and diarrhea.

Prevention

Use appropriate personnel protective apparel. Do not enter ferret and swine rooms when you have a cold or flu.

Chlamydiosis-Parrot Fever

Chlamydophila psittaci AKA Psittacosis, Ornithosis, Parrot Fever is a disease of birds which are the most frequent sources of human infections. Infections in ruminants & cats have caused disease in humans as well.

Transmission

Spread through contact with secretions, desiccated fecal material, direct contact or aerosol. Stress in birds can reactivate shedding of the organism.

Symptoms in Humans

Mainly upper/lower respiratory disease, conjunctivitis, clotting of blood vessels, infection of the heart muscle, liver disease, encephalitis



Prevention & Control:

Birds are quarantined and tested for Chlamydia and housed in Biosafety Level 2 conditions until designated free of the organism before being used in research.

SHEEP

Q-Fever

Q fever is a disease caused by a microorganism called *Coxiella burnetii*. It is widespread in sheep in the USA.

This can be acquired by inhaling contaminated particles from infected sheep, goats, or cattle. There is an especially high concentration of these infected materials in animals at the time that the animals give birth, so particular care needs to be used in handling newborn animals, placental tissues, and other products of conception. This would include the placenta, amniotic fluid, blood, or soiled bedding. In addition, individuals who participate in the routine care of sheep or goats, such as the animal care workers, are at higher risk. This infection is extremely contagious and has been reported to be spread by aerosol and through urine.

Symptoms in Humans

In most individuals, the disease manifests itself as an acute illness, which could be mistaken for influenza. The person has high fevers up to 104° or 105°F. These are accompanied by general malaise, significant muscle aches and pains, and very frequently by a cough. Up to half of the individuals who develop this acute disease will have pneumonia which can be seen on chest x-ray. A large number of people will also develop hepatitis, which is an inflammation of the liver. In most patients the disease is self-limiting and will resolve on its own after ten days to two weeks. In older or ill individuals, this acute illness may take one to two months to resolve.

It is extremely important that should an employee who works with sheep or goats develop an influenza type infection, that he/she mentions to his/her physician the possibility of Q fever. This is not something that would otherwise be routinely thought of and the diagnosis may be missed. Rarely, a person may develop a chronic infection with the Q fever organism. This will happen in less than one percent of infected individuals. This manifests itself as endocarditis, which is an infection of the valves of the heart. This is virtually always fatal when it does occur.

Ninety percent of the people who develop this have had some previous problem with their heart valves. Because of this, people who have congenital heart disease, prior valvular heart disease, or who have a chronic immunocompromised state should not work with infected animals at the time of animal parturition. It is best that these individuals not work with sheep, goats, and cattle at all. This can be determined on a case-by-case basis. Immunocompromised individuals would include persons with AIDS or a positive blood test for the AIDS virus, people who are immunocompromised because of medications which they take (steroids), and people who are immunocompromised because of certain chronic disease.

In order to limit the spread of Q fever, there are a number of procedures which should be followed. Sheep (and goats) are housed under BSL-2 conditions and are strictly off-limits to anyone who does not have a specific need to be there. Sheep are tested for Q-Fever and deemed negative by serological titer before shipping to CMLAF*. Gloves, N-95 respirators, head cover, gown, and foot covers should always be worn when handling these animals. It is important that animals be transported in a designated sheep transport cart with filters. Potentially contaminated surfaces should be decontaminated with dilute solutions of chlorine bleach or appropriate disinfectants. These organisms are quite resistant to destruction, and many ordinary methods of disinfecting will not be adequate. It is extremely important that laboratory doors be kept closed when experiments are in progress.

Transmission

The organism is shed *in* urine, feces, milk and birth products (placenta and placental fluids). Infection may be via aerosol or contact with infected tissues, or with contaminated items (e.g., surgical instruments, surgical drapes).

Disease in Sheep

Infected sheep are likely to be asymptomatic.

Disease in Humans

Coxiella burnetii in humans may be asymptomatic, or may cause fever, chills, retrobulbar headache, pneumonitis, pericarditis and hepatitis.

Prevention

Use male sheep where possible. Assume all female sheep are infected, especially pregnant sheep. Wear protective disposable clothing (cap, gown, gloves, N-95 respirators, footcovers). House sheep under BSL-2 conditions and wash hands after de-gloving.

*Note: serological testing does NOT conclusively identify infected/uninfected sheep.

Brucellosis

Brucella species can be found in cattle, sheep, swine and dogs, with dogs being the most likely source of infection for laboratory personnel. In these species, Brucella causes reproductive abnormalities such as abortion, and testicular abnormalities.

Symptoms in Humans

In man, Brucella is transmitted through contact with infected tissues, and possibly via aerosol. Brucella may cause fever, headache, orchitis, and weakness. Painful generalized lymphadenopathy and splenomegaly occurs. A chronic form can persist for years and is called "undulant" fever, with recurrent attacks of extremely high fever often associated with systemic damage such as endocarditis, and joint inflammation.

Transmission

Laboratory transmission is limited to oral and transcutaneous routes. Contact with infected tissues or fluids (usually placental) and aerosol exposure are the most likely routes of exposure. Brucella will penetrate intact skin and mucous membranes.

Prevention

Animals are serologically monitored and those positives are removed from the colony.

Contagious Ecthyma (Orf)

Orf is caused by a Pox virus that is found worldwide in sheep and goats. In sheep, it causes crusty lesions on the muzzle, eyelids, oral cavity, feet, or external genitalia.



Symptoms in Humans

Humans have large, firm painful nodules that form papules on the hands. They enlarge and become weeping red nodules. These usually resolve within 2 months.



Transmission

Direct contact from animals or old scabs.

Prevention

Segregate infected animals. Wear protective clothing (gloves), and wash hands after contact with sheep.

MICE AND RATS

Infection of these species with diseases likely to be transmissible to humans is unlikely at SUNY -Buffalo given the Standard Operating Procedures in place for animals ordered and delivered through the CMLAF. This is because all animals are purpose bred from vendors of high standard. However, some disease may be asymptomatic, or could be transmitted to the laboratory animals from wild animals after delivery.

Hemorrhagic Fever with Renal Syndrome (HFRS)

HFRS is caused by Hantaan virus (Bunyaviridae). The reservoirs are the striped field mouse and deer mice (*Apodemus*, *Peromyscus*), but similar viruses have been identified in other wild rodents including rats in the USA.

Transmission

Transmission is by aerosol from rodent excreta and bites.

Disease in Rodents

Asymptomatic

Disease in humans

In Japan, fever, severe malaise, weakness, headaches, nausea, vomiting, diarrhea, proteinuria, oliguria or polyuria, and possibly hemorrhagic problems. In southwest USA, fever, flu-like symptoms, respiratory distress and pulmonary edema. Fatality can be as high as 75%.

Prevention

Wild caught rodents are a potential source. Ordering purpose bred animals from reputable suppliers eliminates this risk, as well as maintaining animals in vermin free facilities. Wild rodents are quarantined and serologically tested negative for Hanta virus before being used in research.

Helicobacter

Helicobacter cinaedi (found in Hamsters), *Helicobacter pylori* (primary gastric pathogen in humans), and others include *Helicobacter heilmannii*, *Helicobacter felis*, *Helicobacter bizzozeronii* (found in dogs) can cause asymptomatic disease in humans and animals.

Disease in humans

Immuno-compromised individuals are most at risk. No consistent clinical illness but can lead to gastritis (stomach infection)

Transmission

Fecal-oral transmission

Prevention

Wash hands after handling animals

Lymphocytic Choriomeningitis (LCM)

LCM is caused by an Arenavirus. It is a latent infection in mice and hamsters. Can be found in rodent tumors/cell lines

Transmission

Version date Feb 2014

Humans are infected by aerosols, direct contact with infected excretions, skin or mucous membranes, contact with infected tumors, inhaling dust contaminated with dried excreta, mouse bites and possibly arthropods.

Disease in Animals

The disease may be asymptomatic or may cause a fatal syndrome. Infected mice/hamsters may shed virus for life.

Disease in humans

LCM causes influenza-like disease in humans, which sometimes progresses to meningitis and coma.

Prevention

Control entry of wild rodents into the animal facility, serologic surveillance of rodent colonies, proper sanitation, and testing of all mouse cell lines/tumors. Decontaminate all bite wounds.

Rat Bite Fever

Caused by *Streptobacillus moniliformis*-also referred to Streptobacillary Fever, Streptobacillary Rat-Bite Fever, Streptobacillosis, and Haverhill Fever & Epidemic Arthritic Erythema (caused by the contamination of water, food, or raw milk with this organism), and *Spirillum minus*-also referred to Spirillosis, and Spirillary Rat-Bite Fever. These 2 organisms are present in the oral cavity or upper respiratory passages of asymptomatic rodents – usually rats.

Transmission

From bite of an infected animal, usually rats, but can occur through ingestion of contaminated products. Mice, gerbils, squirrels, weasels, ferrets, dogs, & cats can also spread the disease. *Streptobacillus moniliformis* can infect within a few hours to 2-10 days, and *Spirillum minus* can infect from as long as 1-6wks after exposure (Asia)

Disease in humans

Symptoms include fever, inflammation of the bite site with enlarged lymph nodes, headache, general malaise, weakness, chills, discrete macular rash on the extremities, arthritis (*S. moniliformis*). Most cases spontaneously resolve within 14 days. Can be fatal if left untreated as may develop into pneumonia, hepatitis, pyelonephritis, enteritis, &/or endocarditis.

Prevention

Training in animal handling. First Aid treatment immediately after the bite occurs. Reporting to your physician, if clinical signs develop, and making them aware of these bacteria. Antibiotic treatment when indicated.

Leptospirosis

Leptospira are spirochete bacteria carried by cattle, swine, dogs, rats, mice, gerbils, squirrels, hamsters, rabbits, and other mammals.



Disease in humans

Humans experience sudden onset of fever, headache, leukocytosis, chills, encephalitis, retroorbital pain, conjunctival suffusion, jaundice and hemorrhage.

Transmission

Contact with contaminated urine directly, or drinking contaminated water. Handling infected animals, aerosol exposure, skin abrasions, mucous membrane, rodent bites

Prevention

Protective clothing and control of wild rodent entry into the animal facility, use of purpose bred animals, and vaccination of animals where appropriate.

MULTIPLE SPECIES

Tuberculosis

Mycobacterium tuberculosis, *M. bovis*, *M. avium*, and *M. intracellulare* are bacteria that can infect humans, cattle, and birds, and non-human primates. Reservoirs include cattle, birds, humans, swine, sheep, goats, monkeys, cats, dogs, ferrets.

Mycobacterium fortuitum, *Mycobacterium chelonae*, and *Mycobacterium abscessus* can infect fish, turtles, reptiles and amphibians but *Mycobacterium marinum* is the most common. Can be called "Swimming Pool Granuloma" or "Fish Tank Granuloma"



Disease in humans

In humans, general symptoms include anorexia, weight loss, fatigue, fever and cachexia. Typical lesions include encapsulated inflammatory nodules within the lung. For aquatic species, nodules can develop on hands.

Transmission

Aerosol, ingestion, direct contact.

Prevention

Routine skin testing, protective clothing, gloves, washing hands. Isolation, quarantine, & rapid euthanasia of suspect animals. Vaccination with Bacillus Calmette-Guerin (BCG) strain of *M. bovis* for high risk individuals but will always test positive in a tuberculin skin test.



Listeriosis

Listeria monocytosis is carried by guinea pigs, rabbits and ruminants (sheep, goats).

Disease in humans

Conjunctivitis, meningoencephalitis, abortion, endocarditis, pneumonia and pustular cutaneous lesions.

Transmission

Ingestion and direct contact. Fetuses can be infected by dam

Prevention

Adequate sanitation and protective clothing.

Bacterial Enteritis

Campylobacter fetus, *Salmonella* spp. and *Shigella* spp occurs in dogs, primates and a wide range of mammals. Rats are very susceptible to salmonella infection. Birds & reptiles are particularly dangerous sources of *Salmonella*. Humans are also carriers of *Salmonella* and can transmit this to lab animals including rodents

Disease in humans

Sudden abdominal pain, nausea, fever and diarrhea. *Salmonella* may lead to septicemia.

Transmission

Fecal-oral. Asymptomatic carriers exist and can shed *Salmonella* periodically. Infection can be acquired from pets iguanas, turtles, hedgehogs and sugar gliders

Prevention

Sanitation, personal hygiene, rodent control, vendor monitoring, use of purpose bred animals.

Cryptosporidiosis

Cryptosporidium parvum is an opportunistic, pathogenic, coccidian parasite, known to infect humans, monkeys, livestock, ferrets, pigs, guinea pigs, mice, fish, reptiles and birds. Ruminants are particularly prone to developing protracted, watery diarrhea.

Disease in humans

Neonatal animals are susceptible and both children & adult immunosuppressed humans. Clinical signs develop 1-2wks after contact with infected calves which include diarrhea, vomiting, severe abdominal cramps, lassitude, fever, headache, anorexia, nausea, and malaise.

Ringworm

Microsporum and *Trichophyton* can be carried by infected mammals and birds. Many species of animals are susceptible to fungi that cause the condition known as ringworm. The skin lesion usually spreads in a circular manner from the original point of infection, giving rise to the term "ringworm". The complicating factor is that cats and rabbits may be asymptomatic carriers of the pathogens, which can cause the condition in humans.

Disease in humans

In humans, the disease usually consists of small, scaly, semibald, grayish patches with broken, lusterless hairs, with itching. Scaling red rash, occasionally vesicles and fissures in the skin, thickening and discoloration of the skin are seen.



Transmission

Transmission of the disease is by direct contact with an infected animal or indirect contact with contaminated materials (brushes).

Prevention

Personal hygiene is the best method of prevention, and one should obtain medical assistance if the lesions are noted. Washing hands, wearing gloves, and screening newly acquired animals help in prevention.

Protozoa

Entamoeba histolytica, *Balantidium coli*, *Cryptosporidium* spp, and *Giardia* spp. inhabit the gastrointestinal system of many species of animals including humans. These organisms are often responsible for travelers diarrhea.

Disease in humans

Often asymptomatic or the human may have abdominal pain and diarrhea. Infections are often chronic.



screening of animals.

to allergic dermatitis. However, arthropods may be vectors for the disease. Mites pose the greatest health hazard because they transmit protozoa, spirochetes and helminths.

y.



Helminths

Most parasite worms have an indirect life cycle that is interrupted in the laboratory environment. Proper sanitation, quarantine, animal health surveillance and treatment assist in prevention and control of this disease. Aberrant hosts are a potential cause of visceral & ocular larval migrans. *Toxocara canis* (dog), *Toxocara cati* (cat), *Baylisascaris procyonis* (raccoon) can be carried by infected animals. *Rodentolepis nana* is the dwarf tape worm of mice and can infect humans by ingestion of the eggs passed in the feces.

Disease in humans

Symptoms in humans are related to the migration of the worm larvae throughout the person's body. When an egg is ingested, it enters the lymphatics and circulatory system, where they may spread to almost any organ. The most common sites are the liver, brain, lung, heart and eyes. Inflammation of these organs, along with fever and malaise occurs. Larvae may persist in the visceral organs or the eyes & cause granulomatous lesions resulting in hepatosplenomegaly (enlarged liver/spleen), fever, eye pain, and loss of vision. Raised reddened itchy rash at the site of the larval entry and migration. It occurs most commonly in children on lower extremities who tend to walk barefoot outside.

Prevention

Deworm animals that carry this parasite, good sanitation, good hygiene, protective clothing. Medication that kills roundworms. Rodents purchased from reputable suppliers are free of Dwarf Tapeworm

Bordetella Bronchiceptica

Carried in the respiratory tracts of dogs, cats, rabbits, and rodents

Disease in humans

Causes disease in immune-compromised individuals. Humans may develop pneumonia and bacteremia.

What You Can Do to Reduce Exposure and Protect Yourself

Use Mechanical Barriers:

- Biological safety cabinets
- Chemical fume hoods
- Cage filter tops
- Biosafety Units (Level 2)

Attend applicable Occupational and Environmental Safety training courses

Prevent animal bites and kicks with proper training in handling & restraint

Use Personal Hygiene:

- Wash hands after handling animals
- No eating/drinking in animal areas
- Reduce clutter & disinfect work surfaces

Wear Protective Clothing:

- Gowns, gloves, NIOSH N-95 dust-mist respirators, face shield
- Remove before leaving work area
- Never wear in public spaces (cafeteria)

Ensure all personnel involved with your animals (researchers, caretakers, LAF staff) are aware of the hazards in your study

- Place appropriate biohazard, chemical, or radiation signs, on cages



Tetanus

Ensure all vaccinations are current. The Public Health Service Advisory Committee on Immunization Practices recommends immunization against tetanus every ten years. An immunization is also recommended if a particularly tetanus-prone injury such as a cut or animal bite occurs in an employee where more than five years has elapsed since the last immunization. Every employee should have up-to-date tetanus immunizations.

General Safety Considerations

- Wash hands
- Avoid sharps
- Keep hands away from mouth, nose, eyes
- Wear protective gloves, lab coat, gown
- Remove gloves and wash hands
- Use mechanical pipetting-never mouth pipette
- Never eat, drink, smoke, handle contact lenses, apply cosmetics, take or apply medication
- Reduce splashes or aerosols
- Use Biological safety cabinets
- Wear Eye protection
- Keep doors closed in lab areas to contain contamination
- Decontaminate work surfaces
- Decontaminate infectious waste and dispose correctly
- Use secondary leakproof containers to store or transfer cultures, tissues, or animal liquid specimens

Physical, Chemical & Protocol-Related Hazards

Research protocols can introduce toxic chemicals, human pathogens, or radioactive materials into animals. These hazards can enter the urine/feces/saliva/blood or tissues of animals.

Responsibility

Potential hazards must be determined before beginning an experiment. Read your protocol!

Animal care staff, technicians and other employees must be informed of the hazards and necessary precautions. Place signage on all potential harmful cages. Discuss with LAF Facility Manager before starting a project with hazards, so proper room signage is posted and protective gear is made available. Investigators have an obligation to identify hazards associated with their research.

Obtain and read all Material Safety Data Sheets related to all chemicals and hazards used in your projects.

Infectious Agents can be naturally carried in research animals, as described above but more often are experimentally induced. Human or animal pathogens can be injected into animals as part of the experimental model. Again all personnel in contact with these animals must be made aware of the potential to transmit these pathogens to people and appropriate signage must be posted. Animals are housed in Biosafety level 1-4 containment facilities. Practices follow those outlined in Biosafety in Microbiological and Biomedical Laboratories (CDC-NIH). Biosafety Levels are

determined by the severity of disease the pathogen causes in humans, mode of transmission, availability of human vaccines or therapy, and risk of exposure. Training and prior approval to enter these areas is required. Do not enter unless authorized.

Reporting Injuries That Occur When Working with Laboratory Animals

1. **Reporting Work Related Injuries:** Every person working with animals should be aware of the potential danger from animal bites and/or other mishaps such as self-injection of reagents, needle sticks, other sharps injuries, and mucous membrane exposures from urine, feces, blood or other bodily secretions. Although an animal scratch or bite might not seem serious, its occurrence should be reported to one's supervisor or instructor so that proper measures may be taken. The immediate measures to be taken are outlined below (as adapted from UB Workers' Compensation Accident/Injury Report form). The full form can be found below or at:

http://hr.buffalo.edu/files/phatfile/Workers_Comp.pdf.

- a. **Seek Emergency First Aid** ie wash exposed area with soap and water, rinse eyes at eyewash stations, remove contaminated clothing, use emergency body showers etc as deemed appropriate
- b. Notify your supervisor
- c. Seek medical attention *immediately*. Go to the provider of your choice, Note: ECMC supports the UB Occupational Health Monitoring Program, and has your health history records.
- d. Bring counsel (such as a laboratory colleague or supervisor).
- e. Bring with you all pertinent SOPs and MSDS sheets that relate to any hazards that you work with or that you may be exposed to during your accident/injury.
- f. Inform the medical provider of any exposure to blood-borne pathogens
- g. Inform the provider that the injury is work related.
- h. Occupational health records for individuals approved to work with animals at UB are maintained by Dr. David Hughes, Great Lakes Physicians Services, Erie County Medical Center (898-4153) and can be provided to the medical care staff.
- i. Complete the Accident/Injury Report Form below IMMEDIATELY, (http://hr.buffalo.edu/files/phatfile/Workers_Comp.pdf), and Fax to Annette Lozo at 645-2605
- j. Contact Annette Lozo at 645-7777.
- k. **Contact EH&S immediately at 829-2401 or after hours/weekends call 645-2222.**
- l. Follow the additional procedures below based upon your employee status

State Employees only:

- **Contact the NYS Accident Reporting System (ARS) at 1-888-800-0029**
- Enter the NYS ARS Incident Number under Part 2 of the Accident/Injury Report Form
- The proper insurance carrier for State Employees is: The State Insurance Fund, 225 Oak Street, Buffalo, NY 14203 (716) 851-2000.

Research Foundation Employees only:

- The proper insurance carrier for Research Foundation Employees is: Chubb First. However, Research Foundation Employees should not contact Chubb directly. Please call Annette Lozo at 645-7777.

UB Foundation Employees only: – Contact Josephine Zenosky, Center for Tomorrow, 645-3013

Students:

- Students can use Student Health Services or their private insurer.
- Students are considered “employees” regardless if they are paid or volunteer.

2. Several of the agents responsible for viral, fungal, bacterial, and parasitic infections in laboratory animals are capable of infecting humans. Employees can further contact The Great Lakes Physician's Services, ECMC for advice beyond that offered by the initial medical care personnel. Any subsequent gastrointestinal, eye, respiratory or skin illnesses that may resemble the signs or symptoms of infections in the animals for which they are caring should be reported.

EMPLOYEE ACCIDENT/INJURY INFORMATION

Part 1 - PERSONAL INFORMATION:

Employee's Name: _____ Person #: _____

Job Title: _____ Date of Birth: _____

Home Address: _____ Gender: Male Female

Home Phone: () _____ Supervisor's Name: _____

Department: _____ Bargaining Unit (e.g. CSEA): _____ Line # _____

Dept. Address _____ Normal Work Days (e.g. Mon-Fri) _____

Department Phone: _____ Lost Time Dates Due to Accident: _____

Normal Work Hours (e.g. 9am-5pm):

Part Time Full Time

Part 2 - INCIDENT DETAILS:

Incident Date: _____ Incident Time: _____

Location/Address of Incident (Bldg, Rm, Parking Lot #): _____

NATURE OF INJURY	LOCATION OF BODILY INJURY
<input type="radio"/> Abrasion <input type="radio"/> Dislocation <input type="radio"/> Bite <input type="radio"/> Fracture <input type="radio"/> Bruise <input type="radio"/> Laceration <input type="radio"/> Burn <input type="radio"/> Sprain <input type="radio"/> Cut <input type="radio"/> Needle Stick	<input type="radio"/> Abdomen <input type="radio"/> Face <input type="radio"/> Leg <input type="radio"/> Ankle <input type="radio"/> Finger <input type="radio"/> Mouth <input type="radio"/> Back <input type="radio"/> Foot <input type="radio"/> Nose <input type="radio"/> Chest <input type="radio"/> Forearm <input type="radio"/> Shoulder <input type="radio"/> Ear <input type="radio"/> Hand <input type="radio"/> Teeth <input type="radio"/> Elbow <input type="radio"/> Head <input type="radio"/> Wrist <input type="radio"/> Eye <input type="radio"/> Knee <input type="radio"/> Other _____
Other: _____ _____	<input type="radio"/> Right Side <input type="radio"/> Left Side

What was the employee doing when injured? (Be specific)

How did the injury occur?

What object or substance directly harmed the employee? (e.g. "Concrete floor," "chlorine," "radial arm saw")

Names of witnesses:

Medical Treatment Provided: (check if applicable)

Date:

First Aid by Staff Hospital Personal Physician Other _____

Name, Address and Phone Number of Physician and/or Hospital

Date Notified Supervisor: _____ Time: _____

NYS ARS Incident Number: _____ (State Employees only – will receive upon speaking with ARS)

Part 3 - CERTIFICATION: I certify that the above information is correct:

Employee Signature

Date

**FACT SHEET ON HEPATITIS VACCINE
(RECOMBIVZX - HB)**

A vaccine for protection against Hepatitis B is now available. This vaccine is effective only against Hepatitis B and does not offer protection against other forms of Hepatitis. Hepatitis B (serum hepatitis) is a form of viral hepatitis that is transmitted normally by contact with an infected individual's blood or body fluids.

For this reason, health care workers who have frequent contact with a patient's blood or body fluids are at an increased risk for the development of Hepatitis B. The vaccine is also recommended for individuals requiring frequent blood products, dialysis patients, sexual partners of carriers of the Hepatitis B virus, male homosexuals, IV drug users and children born to mothers who are carriers.

This vaccine has been widely tested and proven to be a safe and effective preventive measure. The vaccine is given as three IM doses spread over a six month period: 1st dose-at elected date, 2nd dose-1 month later, 3rd dose-6 months after 1st dose. In individuals receiving all three doses on time, the vaccine is 95% effective in preventing the development of Hepatitis B upon exposure. Although the duration of protective effect of the Hepatitis vaccine is unknown at present, available data suggest that immunity will last for at least 5 years in persons who have received all 3 doses, after which time a single booster dose of vaccine might be necessary to maintain immunity.

No serious side effects attributable to vaccination have been reported during the course of extensive clinical trials. The main side effect, which was reported, was soreness in the arm at the injection site. Much less frequently a more severe local reaction at the injection site has been reported which generally subsides within two days of vaccination. Low-grade fever occurs rarely and usually is confined to the 48 hour period following vaccination. Occasionally other non-specific side effects such as malaise, fatigue, headache and nausea have been reported.

In Recombivax - HB the antigen - HbsAg - is produced by recombinant DNA technology in the yeast *Saccharomyces cerevisiae*. This vaccine, prepared from recombinant yeast cultures, is free of association with human blood or blood products. Recombivax-HB is contraindicated in anyone who has a known hypersensitivity to yeast.

Testing has not been done to date in pregnant or nursing women and for this reason, it is recommended that these individuals not receive this vaccine unless it is clearly needed.

FACT SHEET ON RABIES VACCINE

Rabies among wild animals-especially skunks, raccoons, and bats-has become increasingly prevalent in recent years as had rabies among dogs and cats. Rabies has occurred in many other animals including livestock, foxes, carnivores and woodchucks. Rabies is transmitted only when the virus is introduced into open cuts or wounds in skin or mucous membranes. Any penetration of the skin by teeth, scratches, abrasions, open wounds or mucous membranes contaminated with saliva or other potentially infectious materials from a rabid animal can cause disease.

Although rabies among humans is rare in the United States, every year approximately 18,000 persons receive rabies pre-exposure prophylaxis. The current vaccine, Human Diploid Cell Rabies Vaccine (HDCV) is made from killed rabies virus and is considered safe and effective when used as indicated. Pre-exposure prophylaxis is given for several reasons. First, it may provide protection to persons with inapparent exposures to rabies. Second, it may protect persons whose post exposure therapy might be delayed. Finally, although pre-exposure vaccination does not eliminate the need for additional therapy after a rabies exposure, it simplifies therapy by eliminating the need for immune globulin and decreasing the number of doses of vaccine needed. Three injections of the HDCV vaccine are given on day 0, 7 and 21 or 28.

Reactions after vaccination with HDCV are less serious and common than with previously available vaccines. During the 3 dose series local reactions such as pain, erythema and swelling or itching at the injection site has been reported among 30%-74% of recipients. Systemic reactions such as headache, nausea, abdominal pain, muscle aches and dizziness have been reported among 5%-40% of recipients. Three cases of neurologic illness (Guillain- Barre syndrome) resolved with out sequela.

Steroids and other immunosuppressive agents or illness can interfere with the development of active immunity after vaccination but do not increase the incidence of side effects. There is no evidence of any fetal abnormalities associated with the administration of the vaccine to pregnant women and if substantial risk of exposure to rabies exists, pre-exposure prophylaxis may be given. Persons who have a history of serious hypersensitivity to rabies vaccine should be revaccinated with caution.

Pre-exposure Vaccination and Post Exposure Therapy of Previously Vaccinated Persons

Pre-exposure vaccination should be offered to persons among high-risk groups, such as veterinarians, animal handlers, certain laboratory workers, and persons spending time (e.g. 1 month) in foreign countries where canine rabies is endemic. Other persons whose activities bring them into frequent contact with rabies virus or potentially rabid dogs, cats, skunks, raccoons, bats, or other species at risk of having rabies should also be considered for pre- exposure prophylaxis. Vaccination is at the expense of the individual.

Pre-exposure prophylaxis is given for several reasons. First, it may provide protection to persons with inapparent exposure to rabies. Second, it may protect persons whose post-exposure therapy might be delayed. Finally, although pre-exposure vaccination does not eliminate the need for additional therapy after a rabies exposure, it simplifies therapy by eliminating the need for HRIG and decreasing the number of doses of vaccine needed - a point of particular importance for persons at high risk of being exposed to rabies in areas where immunizing products may not be available or where they may carry a high risk of adverse reactions.

Primary Pre-exposure Vaccination

Intramuscular Primary Vaccination

Three 1.0 ml injections of HDCV or RVA should be given intramuscularly (deltoid area), one each on days 0, 7, and 21 or 28 (Table 4). In a study in the United States, > 1,000 persons received HDCV according to this regimen. Antibody was demonstrated in serum samples of all subjects when tested by the RFFIT. Other studies have

produced comparable results.

Intradermal Primary Vaccination

A regimen of three 0.1ml doses of HDCV, one each on days 0, 7, and 21 or 28, is also used for pre-exposure vaccination (Table 4). The ID dose/route has been recommended previously by the ACIP as an alternative to the

1.0ml IM dose/route for rabies pre-exposure prophylaxis with HDCV.

Pasteur-Merieux developed a syringe containing a single dose of lyophilized HDCV (Imovax[®] Rabies I.D.) that is reconstituted in the syringe just before administration. The syringe is designed to deliver 0.1ml of HDCV reliably and was approved by the FDA in 1986. The 0.1ml ID doses, given in the area over the deltoid (lateral aspect of the upper arm) on days 0, 7, and 21 or 28, are used for primary pre-exposure vaccination. One 0.1ml ID dose is used for booster vaccination. The 1.0ml vial is not approved for multi-dose ID use. RVA should not be given by the ID dose/route.

Chloroquine phosphate (administered for malaria chemoprophylaxis) interferes with the antibody response to HDCV. Accordingly, HDCV should not be administered by the ID dose/route to persons traveling to malaria- endemic countries while the person is receiving chloroquine. The IM dose/route of pre-exposure prophylaxis provides a sufficient margin of safety in this situation. For persons who will be receiving both rabies pre-exposure prophylaxis and chloroquine in preparation for travel to a rabies-enzootic area, the ID dose/route should be initiated at least 1 month before travel to allow for completion of the full three-dose vaccine series before antimalarial prophylaxis begins. If this schedule is not possible, the IM dose/route should be used. Although interference with the immune response to rabies vaccine by other antimalarials structurally related to chloroquine (e.g. mefloquine) has not been evaluated, it would seem prudent to follow similar precautions for persons receiving these drugs.

Table 4. Rabies pre-exposure prophylaxis schedule, United States 1991.

Type of vaccination	Route	Regimen
Primary	IM	HDCV or RVA, 1.0 ml (deltoid area), One each on days 0, 7, and 21 or 28.
	ID	HDCV, 0.1 ml, one each on days 0, 7, and 21 or 28
Booster*	IM	HDCV or RVA, 1.0 ml (deltoid area), day 0 only
	ID	HDCV, 0.1 ml, day 0 only

*Administration of routine booster dose of vaccine depends on exposure risk category.

Booster Vaccination

Pre-exposure Booster Doses of Vaccine

Persons who work with live rabies virus in research laboratories or vaccine production facilities (continuous risk category) are at the highest risk of inapparent exposures. Such persons should have a serum sample tested for

rabies

antibody every 6 months (Table 4) Booster doses (IM or ID) of vaccine should be given to maintain a serum titer corresponding to at least complete neutralization at a 1:5 serum dilution by the RFFIT. The frequent risk category

includes other laboratory workers, such as those doing rabies diagnostic testing, spelunkers, veterinarians and staff,

animal-control and wildlife officers in areas where animal rabies is epizootic, and international travelers living or visiting for greater than 30 days) in areas where canine rabies is endemic. Persons among this group should have a serum sample tested for rabies antibody every 2 years and, if the titer is less than complete neutralization at a 1:5 serum dilution by the RFFIT, should have a booster dose of vaccine. Alternatively, a booster can be administered in lieu of a titer determination. Veterinarians and animal control and wildlife officers working in areas of low rabies enzooticity (infrequent exposure group) do not require routine pre-exposure booster doses of HDCV or RVA after completion of primary pre-exposure vaccination.

Post-exposure Therapy of Previously Vaccinated

Persons

If exposed to rabies, persons previously vaccinated should receive two IM doses (1.0 ml each) of vaccine, one immediately and one 3 days later. Previously vaccinated refers to persons who have one of the recommended pre-exposure or post-exposure regimens of HDCV or RVA, or those who receive another vaccine and had a documented rabies antibody titer. HRIG is unnecessary and should not be given in these cases because an anamnestic antibody response will follow the administration of a booster regardless of the prebooster antibody titer.

Pre-exposure Vaccination and Serologic

Testing

Because the antibody response after these recommended pre-exposure prophylaxis vaccine regimens has been

satisfactory, serologic testing is not necessary except for persons suspected of being immunosuppressed. Patients who are immunosuppressed by disease or medications should postpone pre-exposure vaccinations.

Immunosuppressed persons who are at risk of rabies exposure should be vaccinated and their antibody titers checked.