UNIVERSITY OF MALAYA

Guidelines for Occupational Health and Safety in the Care and Use of Animals

Animal Experimental Unit
Faculty of Medicine

Accepted by

Institutional Animal Care and Use Committee
Faculty of Medicine

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OCCUPATIONAL HEALTH AND SAFETY IN THE CARE AND USE OF ANIMALS

POLICY STATEMENT

As stated by the Vice Chancellor of University of Malaya, the University is committed to providing a safe and healthy work environment for all of its students and employees.

Exposure to, or working with animals is not risk free. Therefore, people who come into contact with animals must be made aware of the potential hazards associated with such contact. Principal investigators and supervisors are responsible for the safety and training of the personnel they supervise with regard, whether these individuals are paid employees, volunteers or students working with animals. Personnel who have been properly informed, shown good examples, and working safely, greatly reduce the potential risks involved in working with animals. Safety must not be sacrificed for any reasons, be it production, time limitations or financial costs.

The success of the Occupational Health and Safety in the Care and Use of Animal programs is dependent upon active participation from and cooperation of administrators, faculty staff and students. Participation in the program is required for all individuals who have substantial contact with animals. These may include animal researchers, animal care providers, technicians, students, volunteers, veterinarians, facility maintenance engineers, custodians, secretaries, housekeepers, security and other staff working in animal areas.

By working together within this program for occupational health and safety, we will help to make certain a safe, professional and productive environment of animal care and use for personnel and animals alike.

Sincerely,

Prof. Dr. Mohd Rais Bin Mustafa
Deputy Dean of Research
Faculty of Medicine
University of Malaya

SECTION I: OUTLINE OF THE FACULTY OF MEDICINE ANIMAL CARE & USE OCCUPATIONAL HEALTH AND SAFETY PROGRAM

Part A: Program Goals & Responsibilities

The overall goal of an occupational health and safety program is to prevent occupational injury, illness and exposure.

The Faculty of Medicine (FOM), the IACUC and individual investigators and supervisors will:-

1. Provide those individuals who have substantial contact with animals appropriate guidelines for occupational health and safety in the care and use of animals that outline general health and safety issues associated with working with animals.

2. Provide those individuals who have substantial contact with animals the required occupational health and safety training program.

3. Provide those individuals who have substantial contact with animals a hazard and risk assessment; and

4. Make available to those individual who have substantial contact with animals any necessary medical evaluations, vaccinations, or immunizations (e.g., tetanus etc.) at a cost to the department/supervisor/principal investigators (PIs)

Part B: Occupational Health and Safety Program at FOM

Administration: The animal occupational health and safety program is administrated under Animal Experimental Unit, and the IACUC Office (Office of Deputy Dean of Research and Innovations, FOM).

The functions of the offices, committees and personnel include:

The IACUC Office

- Processes Animal Use Protocol (AUP) protocols and keep records.
- Helps to coordinate the OHS program and communication between different offices and individuals.
- Serves as a contact place and information center for PIs, personnel, and various collaborating offices about the IACUC and the animal OHS program.
- Maintains a copy of emergency contact list for animal facilities.
- Maintains documentation of personnel training for proper use and care of animals in paper and database files.

The IACUC

- Helps to identify potential medical risks, animal housing facility designs, physical hazards, etc., during protocol review.
- Refers investigators to other committees (Institutional Biosafety and Biosecurity Committee, etc.)
- Suggests appropriate training sessions for investigators and their personnel.
- Assists in the implementation of the OHS Program.

The Attending Veterinarian

- Aids PIs in the formulation of their research projects, helping to identify potential risks and hazards.
- Suggests alternatives to dangerous procedures, where possible.
- Refers PIs to other committees for protocol review.
- Alerts PIs to training requirements.
- Maintains a copy of emergency contact list for animal facilities.

Animal Experimental Unit (AEU)

- Coordinates and provides Occupational Health & Safety in the Use of Animals Program.
- Administer basic training programs in Lab Safety.
- Assists in coordinating plans and procedures for safety emergencies and concerns.
- Assists in identifying potential work place hazards during protocol review (e.g., working with chemicals or radiation, fire exits and extinguishers, etc.).
- Assists in providing information to personnel in obtaining appropriate personal protective equipment (PPE) (e.g., respirators).
- Evaluates performance of biosafety cabinets, safety showers, eye wash stations, chemical storage; fire alarms and drills; and other equipment.
- Coordinates incident reporting and investigation of all events and near misses.
- Updates the written OHS Program for the Care and Use of Animals per IACUC requirements.
- Requests procedure from the designated medical providers.

- Assists in the implementation of the OHS Program and maintain data base of participants.

Designated Health Care Providers

- Provide evaluation of health assessments at the department's /PIs' expense.
- Provide medical examinations and immunizations to high-risk and other designated personnel.
- Help to identify further risks for personnel based on medical history or conditions (e.g., pregnant women, pre-existing allergies).

The designated medical provider (DMP) is a panel clinic for staff and students. It is recommended that any required post-offer or pre-hire medical examinations or testing be conducted only at University of Malaya's designated panel clinics.

Department of Development & Estate Maintenance (JPPHB)

- Disposes of hazardous waste for researchers.
- Repairs and maintains facility equipment and machinery.

Individual Departments

- Review and update the functional and environmental demands/requirements associated with the work to be performed for each position, class or project.
- Identify and require personnel who have substantial contact with animals to participate in the OSH program.
- Complete the Hazard and Risk Assessment for high risk positions or substantial animal contact.
- Cover the cost of certain medical/evaluation examinations, immunizations, and vaccinations.
- Pay for equipment purchases and/or repairs.
- Purchase personal protective equipment (PPE) and enforce its use.
- Implement any and all precautions or preventive measures outlined by the designated medical provider.

Principal Investigators

- Design protocols involving animals.
- Work with the AV, IACUC, and AEU to identify potential problems and risks to personnel.
- On identifying the risks, complete the Hazard and Risk Assessment (Appendix B) for all personnel they supervise, based on the type of work they will be doing (e.g., allergies; kicks, bites, scratches; zoonosis; infectious agents).
- Provide each individual who has substantial contact with animals a completed Hazard and Risk Assessment (Appendix B).
- Complete the Medical Health Evaluation form (Appendix C) and explain the process of the medical evaluation.
- Perform Biological risk assessment (Appendix E) to identify and address potential risks before the commencement of work involving infectious agents.
- Pay for certain medical costs like medical examinations and immunizations that are associated with particular procedures, projects, or persons.

Staff and Students

- Responsible for personal hygiene and safety during all animal procedures.
- Comply with recommended and required rules and guidelines for occupational health and safety in animal care and use.
- Attend and participate in training programs (occupational health and safety and otherwise).

Part C: Principal Elements of an Animal Care & Use OHS Program

The following elements and examples are essential components of an effective animal care and use occupational health and safety program:

Personnel Training:

- For specific protocol and department Safe Operating Procedures is the sole responsibility of the Department, PI and Supervisor.
- Should provide personnel with clear definitions and descriptions of their duties and the hazards associated with those duties (such as zoonosis, chemical hazards, physical hazards like radiation and allergies, handling waste materials).
- Should provide personnel with information about levels of risk associated with working with animals and personal health conditions (e.g., special precautions to avoid hazards for pregnant women or persons with chronic diseases, etc.).
- Ensure that personnel are proficient in implementing safety precautions.
- That are department-specific should be the responsibility of individual departments.

Hazard and Risk Assessment (Appendix B):

- Identifies hazardous biological, chemical, or physical agents.
- Identifies potential hazards that are inherent to animal work, such as animal bites, chemical cleaning agents, allergens, or zoonosis.
- Assesses extent and level of participation in occupational health and safety training program on the hazards posed by the animals and materials used; the exposure intensity, duration, or frequency; the susceptibility of the personnel; and the history of occupational illness or injury in the particular workplace.
- Should be completed by PI or supervisor for those who have substantial contact with animals, provides a copy to the individuals and sends copy to the AEU.

Medical Health Evaluation for Animal Contact (Appendix C):

- Identifies potential hazards that are inherent to animal work, such as animal bites, chemical cleaning agents, allergens, or zoonosis.
- Assesses the exposure intensity, duration, or frequency; the susceptibility of the personnel; and the history of occupational illness or injury in the particular workplace.
- Those who have substantial contact with animals and a copy of the completed assessment form should be provided or made available to AEU.

Personal Hygiene:

- Sets high standards for personnel cleanliness and hygiene.
- Requires suitable clothing, gloves, masks, hair covers, shoe covers, etc.
- Requires hand-washing and changing clothes, where necessary.
- Ensure all laboratory personnel, including service and custodial staff and visitors, understand the chemical and biological dangers associated with the lab or facility.

- Affixes biohazard signs on doors outside laboratories where biohazardous material is handled or stored. The protocol to be followed in case of a spill of the biohazardous materials should be posted in a visible location in the laboratory or facility.
- Restricts laboratory or facility access and keep doors locked when unattended.
- Keeps the facility clean and free of clutter: ensure that emergency safety devices (fire extinguishers, eye washes, etc.) are easily accessible and in working order.
- Ensures that all personnel, students and visitors wear protective clothing such as lab coats, gloves and safety glasses. Remove lab coats or gowns before leaving the laboratory or facility.
- Means do not eat, drink, smoke, store food and food utensils, apply cosmetics or lip balm, or insert or remove contact lenses while in the facility or laboratory.
- Restrains long hair. Avoid wearing loose clothing or jewelry, shorts, open-toed shoes or sandals.
- Carries out procedures so as to minimize risks of splashes, spills, and generation of aerosols.
- Does not allow pipetting by mouth.
- Requires the use of hypodermic needles only when absolutely necessary. Do not bend, break, shear or recap used needles. Use the appropriate sharps containers.
- Requires the use of a two-person team to inoculate animals when appropriate.
- Requires washing hands after handling infectious material and before leaving the laboratory.
- Requires decontamination of all contaminated materials before disposal or reuse.
- Requires decontamination of laboratory surfaces following any spill of biohazardous materials and at the end of each workday.
- Requires reporting of all spills, accidents, and incidents immediately (as required by AEU 24-hour reporting requirements).

Facilities, Procedures, and Monitoring:

- Ensure routine maintenance and cleanliness of facilities and supplies.
- Ensure routine inspection, maintenance, and repair of equipment.
- Ensure disposal of contaminated bedding properly.

Animal Experimentation involving Hazards:

- PIs, departments and supervisors must maintain up-to-date written policies governing experimentation with hazardous biological, chemical, physical agents.
- Individuals must use recommended practices and procedures, and facility requirements for working with hazardous biological agents and materials.
- Individuals must use special facilities and safety equipment as recommended.
- Individuals must dispose of hazardous or contaminated waste properly.

Personal Protection:

- Ensures the use of required clothing, shoes, shoe covers, gloves, arm protectors, masks, face shields, hearing protection, respirators, etc.

Medical Evaluation and Preventive Medicine for Personnel:

- Comply with required medical evaluations for high risk positions and those with substantial contact with animals.
- Comply with required immunizations, and vaccinations for particular individuals.

- Inform personnel how to report accidents, injuries, illnesses, exposures and property damage.

SECTION II: HAZARDS AND RISKS

Part A: Defining Hazard and Risk

What is a hazard?
A hazard is the inherent danger involved in working with a particular animal, material, equipment, process, procedure or system.

What is risk?
Risk is a measure of the likelihood of a consequence from working with a certain hazard.

What are the hazards involved in working with animals and animal projects?
There are many hazards involved in working with animals. These hazards range from minor to very serious, and can include things like allergies, bites, zoonotic diseases, working with hazardous chemicals or radiation, and handling contaminated waste. Information follows in this document that describes many of the potential hazards individually.

What are the risks involved in working with animals?
The risks involved with animal work, range from low to high potential of injury or illness from the identified hazards.

What can be done to avoid hazards and reduce risk?
The primary way to avoid problems in work with animals is to know what the hazards are and what precautions to take in order to avoid them. For work involving infectious agents, biological risk assessment must be performed to identify and address potential risks before the commencement of the work (Appendix E: Biological Risk Assessment form). A complete biological risk assessment form should be forwarded to University of Malaya Institutional Biosafety and Biosecurity Committee (UM IBBC) for their acknowledgement and approval.

Part B: Animal Workplace Hazards & Risks

1. Types of Hazards

The following chart outlines some, but not all categories and types of potential hazards that may be present in work with animals.

Example: Types of Hazards that May be Present during Work on Animal Protocols.

Types	Examples
Physical Hazards	Bites, sprains, scratches, sharps, lasers, machinery, slips, falls
Chemical Hazards	Burns, skin irritations, inhalation, ingestion
Zoonosis	Human diseases acquired from animals
Allergens	Allergies to rodents, rabbits (urine, contaminated litter, dander, hair)
Ergonomics	Heavy lifting, repetitive motion, body mechanics, posture
Infectious Agents	Bacteria, fungi, parasites, protozoa, rickettsia, viruses, blood- borne pathogens

2. Animal-Related Hazards & Risks

Model animal risk assessment summary for risk ranks of animal-related activities for immunocompetent adult humans. Risk ranks are based on both the likelihood of an incident and the seriousness of the possible abnormal condition. Risk levels for experimental agents are not included in the chart, and use of experimental hazardous agents requires review and approval of the appropriate safety committee.

Risk of	Bite wound (a)	Scratch wound (a)	Microbial flora exposure (b)	Allergy development
Chick embryo	1	1	2	1
Fish	1	1	2	1
Reptiles	3	1	2	1
Amphibians	1	2	2	1
Mouse	2	2	1	3
Rat	3	2	1	3
Hamster	3	2	1	2
Guinea Pig	2	2	1	3
Rabbit	2	3	1	3
Cat	3	3	3	3
Dog	3	2	2	2
Goat	1	2	3	2
Pig	2	1	3	2
Wild mammals & birds	4 (if handled)	4 (if handled)	3	2

Key:

1 = No known risk
2 = Minor risk
3 = Moderate risk
4 = Significant risk
5 = High risk

a = Potential microbial contamination and physical trauma are both included. Tetanus prophylaxis is required for all staff members.
b = Risk of inhalant, ocular, or oral exposure to microbial or parasitic agents from animals acquired through institutionally approved vendors.

Zoonosis. Diseases communicable from animals to humans are called zoonosis. In many cases the animals show little, if any, sign of illness. A bacterium in the normal flora of a healthy animal may cause a serious disorder in a person exposed to it. While the animals have developed "resistance" to these microorganisms, humans with no previous exposure to the agent lack this protective immunity. 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.

Information can be found at:-
http://www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/Zoonoses/TableZoonoticDiseases/

Zoonosis can be acquired through various routes of infection, including contact with animal products, the animal itself, or a byproduct of the animal. The routes of infection include ingestion, inhalation, and penetration of broken or unbroken skin, wound penetration; and contact with the mucous membranes of the eyes, nose, and mouth via the following:

- Animal bites and scratches;
- Contact with animal tissues and cultures, body fluids, and excreta;
- Inanimate objects that are contaminated by the animal or animal contact; and
- Exposure to aerosols produced as a result of activities such as cleaning cages.

Individuals whose work involves substantial exposure to or handling of animals and animal tissues, body fluids, and cell cultures should be aware of the possibility of the illnesses that may be transmitted by contact with animals. In the zoonosis training module, at-risk individuals are informed of laboratory-acquired zoonosis, causative microorganisms, animals most commonly in contact with humans, appropriate animal handling procedures, personal hygiene, and protective equipment specific to the animal type and use.

Information can be found at:-
http://www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/Zoonoses/TableZoonoticDiseases/

All known human exposure to a zoonotic disease is considered an incident and must be immediately reported by the individual to their supervisor or principal investigator for appropriate medical treatment and investigation. A Report of Occupational Incident/Injury/ Illness/Exposure Report (Appendix A) must also be filed immediately or within 24 hours to the Animal Experimental Unit (AEU).

If a zoonotic disease is suspected in an animal, the principal investigator or supervisor and the FOM Attending Veterinarian shall be notified immediately for appropriate action.

Allergens. Approximately 20% of people who work with animals have animal allergies. Animal allergies may be present before an individual begins formal work with animals, or the allergy may develop during the course of the individual's work with animals. Animal hair, fur, skin, dander, urine, saliva, scratches, etc., can cause or aggravate allergies to animals.

Physical Hazards. Physical hazards associated with animal contact can include animal bites, scratches, and kicks; noise; waste; and physical methods of euthanasia. Further information follows regarding physical hazards and ways to minimize the risk of injury from physical hazards.

Infectious Agents. Animal contact can bring personnel into contact with infectious agents, either from the animal itself or from agents introduced for the research project.

3. Non-Animal Risks

Possible Risks and Hazards Present During Work on Animal Protocols.

Item	Examples	Potential Risk
Latex	Gloves, masks	Allergies
Freund's complete adjuvant		Can cause sensitization to TB
Steam/hot water	Used extensively for sanitation and sterilization	Can cause severe thermal burns
Chemicals	Detergents, acidic de-scaling agents, alcohol, cleaning products, flammables	Can cause chemical burns or toxicity
Pharmaceuticals	Anesthetics, antibiotics, analgesics, tranquilizing agents, test drugs	Can be toxic
Heavy items	Lifting feed bags, caging, animals	Can cause lifting injuries
Wet floors	Mopping floors and cleaning labs or animal housing facilities	Slipping and falling
Carcinogens, mutagens, teratogens, and other hazardous test substances	Cancer-causing agents, spills	Agents can cause genetic mutation; disruption of normal cellular development in an embryo or fetus
Biological toxins	Poisons and venoms	Agents capable of causing illness and/or death
Ultraviolet (UV) light	Germicidal lamps, outdoor work	Can damage eyes and skin
Sharps	Needles, scalpels, broken glass	May produce physical damage
Infectious agents	E. coli, Salmonella, parasites, Hanta virus, rabies	Risk of infection and illness
Husbandry	Cleaning bedding, cages	Exposure to contaminated bedding, waste
Flammable materials	Chemicals, bedding, paper towels and gowns	Burns, property damage
Pressure vessels	Compressed-gas cylinders, high- pressure washing equipment	Risk of explosion and personal injury
Lasers	Lasers	Eye damage due to viewing; burns
Electricity	Electrical hazards are present wherever electric current is present; absence of plate on wall socket; frayed or exposed wires	Electric shocks, burns
Ionizing radiation	Using radioisotopes in research animals, X rays, gamma rays	Exposure to radiation

Noise	Working in a loud environment with machinery and animal noise	Hearing damage, loss of concentration, distraction
Machinery	Excessive noise; dangerous equipment	Hearing damage; injury
Ergonomic hazards	Heavy and repeated lifting (of cages, large animals), pinch points	Risk of injury

4. Risk Factors to Individual Personnel

Examples of risk factors to individual personnel.

Personnel type	Risk(s)	Caused by
Women of childbearing age	Threat to fetus	Exposure to cat feces (toxoplasmosis), sheep and goats (Q fever)
Individuals with chronic or pre-existing conditions (e.g., asthma, allergies, serious disease of liver, kidney, or spleen; immune system deficiencies; steroid, radiation, or chemotherapy patients; heart valve disease)	Worsening of pre-existing condition; further illness or complications	Exposure to animal skin, dander, fur, urine, etc.; exposure to Q fever or other zoonotic agents

Part C: Levels of Risk and Participation in the OHS Program

1. Health and Risk Assessments/Examinations

PIs, departments, supervisors and employees must consider the hazards and risks involved with each task or project conducted in their lab or facility.

PIs, departments and supervisors must discuss the potential hazards and risks associated with the animal work tasks that will be performed. Supervisors must complete a Hazard and Risk Assessment (Appendix B) for each position they supervise.

This Hazard and Risk Assessment addresses broad issues and questions like:

i. What are the potential work-related animal, non-animal, and individual hazards and risks involved with the work you will be performing or supervising?

ii. What preventive measures or actions are available (e.g., medical examinations, immunizations or vaccinations, personal protective equipment, avoiding contact with certain species) that could reduce, avoid, or eliminate identified hazards and risks?

The answers to these questions are intended to provide the Medical Officer with information on the health hazards, demands and risks involved with the work that will be performed.

Biological Risk Assessment (Appendix E) must be completed if the work involves infectious agent(s). The Biological Risk Assessment identifies and addresses potential risks involved in the work to be performed with the infectious agent on the animals. The questions will help the PIs, departments and supervisors to determine specific controls required to minimize the biorisks associated with the work. The issues addressed will also facilitate the PIs, departments and supervisors to determine whether it is safe to conduct the work in the lab or facility.

Any work involves the use of infectious and potentially infectious agents/materials and biological toxins must be reviewed and approved by University of Malaya Institutional Biosafety and Biosecurity Committee (UM IBBC). The submission flowchart and other relevant documents needed for the submission can be found at UM IBBC website, http://ibbc.um.edu.my/?modul=Notification_

Upon UM IBBC approval, a copy must be given to the individual for review. They will use this form to aid in the completion of their Medical Evaluation Form (Appendix C) and Animal Contact Health Questionnaire (Appendix D). A copy will also be provided to the Medical Officer as they proceed with the occupational health evaluation.

A designated Medical Officer will complete an evaluation of the Medical Evaluation for Animal Contact Form as a medical reference baseline. Once the Medical Officer has completed the evaluation of the Medical Evaluation for Animal Contact Form, AEU will be notified as to whether or not a physical exam/vaccination is recommended. AEU will then notify the individual. Cost of the evaluation, examinations, vaccinations, immunizations, or other recommended medical procedures will be paid on a case-by-case basis, but is the responsibility of the department/facility/student.

Vaccinations may be recommended based on the Health Evaluation. Individuals must participate unless they can provide supporting documentation for not completing them.

i. Tetanus immunization: Boosters are suggested every 10 years. The history of immunization will be determined at the time of the initial assessment. Additional immunizations will be administered as needed.

ii. Other: Based on the health and hazard assessment, the consulting physician will collaborate with the AEU to advise of or determine the need for other or additional immunizations (such as tuberculosis or hepatitis).

iii. Allergies: Allergies should be identified and documented post-offer/pre-hire (Appendix B). Individuals with pre-existing allergic tendencies will be encouraged to seek help from their private physician.

iv. Special Precautions for Women of Childbearing Age: Serological samples may be taken on all women handling high-risk species prior to beginning work to avoid confusion about the significance of various positive antibody tests in case of subsequent pregnancy. Female caretakers, especially those known to be pregnant, should not be exposed to work involving toxoplasmosis infection. Working with hazardous drugs, agents or toxic chemicals during pregnancy is also strongly discouraged. Personal protective equipment (PPE) should be worn at all times and additional precautions observed for pregnant women, as outlined by the principal investigator, supervisor or physician prior to the start of work with animals. Communicate your work conditions to your medical officer/medical provider.

2. Medical Officer Reports

Following the medical exam, the medical officer/health care provider will provide a copy of the Medical Evaluation Form (Appendix C) to AEU to indicate:

a) No existing health condition has been identified that could alter the employee's exposure- risk profile; or

b) A health condition exists that affects the employee's exposure-risk profile, but the risk can be minimized (and will provide example precautions or preventive measures – e.g., vaccinations; wearing gloves, masks, etc.; avoiding contact with certain species – that would minimize or eliminate the hazards and risks); or

c) A health condition exists that affects the employee's exposure-risk profile that cannot be eliminated or minimized.

All medical records are confidential. They will be maintained by the Designated Medical Provider and Human Resources and will be shared only with the patient/individual. As noted previously, the individual may be asked to authorize the release of limited information from the healthcare provider to AEU regarding any necessary precautions or restrictions necessitated by any physical limitations or conditions which could affect personal health or the health of the animals. These could include current conditions and possible future conditions.

If a health condition exists, or there is a change in one's health that could alter the individual's exposure-risk profile, the individual will inform their supervisor of the medical provider's recommendations for eliminating the risk.

3. Levels of Risk & Participation

Occupational Health Program Participation Based on Risk/ Rank of Animal-Related Activity.

	Basic OHS Training Module	Review of information packet with supervisor	Training in animal handling & protective measures	Medical evaluation & surveillance recommended	Immunizations or Vaccinations Recommended
Level 1 (no known risk)	Yes	Yes	Yes	No	No
Level 2 (minor risk)	Yes	Yes	Yes	No	TBD*
Level 3 (moderate risk)	Yes	Yes	Yes	TBD*	Yes
Level 4 (significant risk)	Yes	Yes	Yes	Yes	Yes
Level 5 (high risk)	Yes	Yes	Yes	Yes	Yes

* TBD = to be determined by the individual, and/or a healthcare provider.

The cost of health assessments, medical examinations and vaccinations/immunizations are to be paid by principal investigators, departments, or individual personnel. Students may be accountable for certain medical costs (e.g., the cost of a tetanus shot) if such treatment is required for a course involving animals (i.e., students pay for a shot just as they would for a textbook).

Part D: Avoiding Hazards & Risks: Prevention & Control Strategies

1. Exposure Control & Prevention

Exposure Control Methods: (Includes some, but not all, strategies for avoiding, reducing, or eliminating exposure to hazards and risks).

Hazard or Risk Types	Prevention Strategy Examples
Engineering Controls	Practice product substitution; use barriers; allow for adequate filtration and ventilation; maintain proper temperature and humidity controls; regularly check fire extinguishers, alarms, sprinklers
Work Practice Controls	Alter animal handling and transport to reduce exposure; pay attention to personal hygiene, housekeeping, and waste management practices; be informed of and practice Standard Operating Procedures (SOPs)
Personal Protective Equipment (PPE)	Wear gloves, uniforms, gowns, aprons, hard hats, safety glasses, steel-toed boots, respirators, etc.
Training & Education (also see below)	Participate in AEU Induction and RCULAC Courses (basic lab safety)

Equipment Maintenance & Operation	Follow SOPs; be trained in the proper use of equipment and machinery; regularly check machine performance (report any problems or needed repairs to supervisor immediately)
Animal Source	Purchase animals from reputable vendors; avoid contact with wild animals or animals of unknown origin; take necessary precautions (PPE, proper animal handling instruction) when it's necessary to work with high-risk species
Animal Housing, Caging, Bedding	Follow SOPs; wear gloves, protective clothing, use proper posture and body mechanics (lifting, pushing, pulling, etc.).
Hazardous Material Use	Follow SOPs; attend university training in lab and chemical safety
Infectious agents	Participate in biosafety and/or biosecurity courses
Waste Disposal	Follow university policies and procedures for hazardous waste removal
Animal Transportation	Do not transport animals through common, non-animal corridors or facilities (may expose non-animal personnel); use proper techniques and transport devices
Emergency Procedures	Know the contact people for each facility; be sure emergency phone numbers are posted in animal facilities; be familiar with standard emergency procedures like evacuation routes and emergency exits, what to do in the event of a chemical spill, which medical providers to go to in medical emergencies, and how to report injuries
Zoonosis	Obtain appropriate immunizations or vaccinations; wear gloves and protective clothing when handling species with zoonotic disease potential; participate in medical consultations and surveillance; avoid high-risk animals and situations
Animal Handling	Learn proper handling techniques; wear protective gloves, clothing, respirators, etc.
Good Housekeeping	Maintain a clean and organized work area that is free from clutter
Personal Hygiene & Safety (also see below)	Wash hands; wear PPE, as necessary
Women of Childbearing Age	Avoid all exposure to possible toxoplasmosis infection and/or do not have contact with cat feces; Avoid contact with hazardous chemicals – especially during the first trimester; wear PPE
Medical Assessments & Immunizations /Vaccinations	Receive the recommended immunizations to prevent disease transmission; Learn strategies (such as wearing a mask) that would reduce or eliminate exposure to health-altering situations (like allergies)

Departments, supervisors and principal investigators will be responsible to provide training for the students and employees working under their supervision. The training will be specific to the species and procedures to be used.

Departments will be responsible for maintaining the documentation of the Departmental Specific Training. Training requirements use a fiscal year calendar and documentation must consist of the following information: date of training, topics covered, name of the person providing the training, and the participants acknowledgement of attendance. Records should be maintained for five years, unless otherwise specified.

2. AEU Training Program

The key element to a successful accident prevention program and in any occupational safety and health program is effective job orientation and safety and health training. AEU will address the basic safety training and continuing education of the job elements, on-the-job safety, general health, and the prevention of injury and illness (Baseline Safety Training). The program includes an employee orientation process in which all employees learn the general safety rules, safe operating procedures, ergonomic hazards, and claims management procedures.

The program will, at a minimum, require departments to complete orientation and initial training for new, transferred and reassigned employees to different positions, along with periodic regular training on at least an annual basis for all employees. Required training will consist of documentation on the following:-

- Basic Lab Safety Training in AEU Induction Course
- Occupation Health and Safety with Animals in Responsible Care and Use of Laboratory Animal Course (RCULAC)
- CPR/First Aid/AED
- Other

Additional training will be conducted as follows:-

- Whenever employees change positions or begin a new position for which training has not been previously received.
- Whenever new species, substances, processes, procedures or equipment are added or changed that may present a new or previously unrecognized hazard.
- Whenever an incident/accident investigation recognizes a training need.

3. Emergency Procedures & Reporting Incidents, Injuries, Illnesses or Near Misses

Emergencies

Dial 999 in the event of fires, medical emergencies, or other serious threats. University Safety Office may also be contacted at 03-7967 7768 ext 3532. Follow the procedures outlined by your department in the event of emergencies.

If the emergency or problem involves the animals, refer to the emergency contact placards posted in the animal facility for the names and phone numbers of the appropriate contact person(s) for that facility. The FOM Attending Veterinarian can also be contacted in the event of animal emergencies (03-7967 7564/7577).

Reporting Work Place Incidents, Injuries, Illnesses, or Near Misses

To promote a safe work environment, all work related near misses, incidents, injuries, illnesses and exposures will be reported immediately or within 24 hours by the employee to their immediate supervisor or next person in charge at the time of injury, and AEU.

When a work related incident/injury/illness/exposure occurs, whether medical attention is needed or not, the following steps must be followed:-

a) Assess the injury. Is medical treatment needed, or is first aid adequate? If it is an emergency, call 999 or Triage Counter, UMMC at 03-7949 2500
b) If non-emergency medical care during regular business hours is required, seek treatment at FOM's Designated Medical Provider. If it is after hours or if you are out of town, seek medical attention at the nearest medical facility.
c) Complete the AEU incident report for every incident and fax this report to AEU (03-7967 7894) within 24 hours. It is a requirement that incident reports be completed and submitted to AEU immediately, no matter if the incident requires medical attention or not.
d) The Supervisor is required to assess the event/incident for immediate hazards and conduct an investigation. The supervisor must identify and document corrective actions to prevent similar incidents from occurring again.
e) The injured individual is required to follow all medical restrictions, 24 hours a day, 7 days a week.

4. Animal Care after Human Injury

Special procedures may be required to identify the risk of human exposure to diseases for a particular animal. All samples, animals, or equipment involved in a human injury shall be preserved and have special identification to aid in further testing and/or procedures. The principal investigator or supervisor and the FOM Attending Veterinarian should be notified immediately for appropriate care of the animal, investigation of the incident, and corrective action. If the animal is used for teaching or research, medical information and care required shall be relayed to all participants.

Part E: Students in Classes, Volunteers and Ancillary Personnel

1. Volunteers, Guests, Visiting Researchers/Scholars

a) This includes individuals NOT listed on an Animal Care and Use Protocol and who are not FOM employees or students, but do have substantial contact with animals used in research or teaching.
b) The Principal investigator or Facility Manager will provide each individual with information pertinent to the species/protocol on which they are working and document that the information has been provided.
c) Each principal investigator or instructor will provide those with substantial contact to animals with the following information:-

    i. The availability of, and the option to request medical evaluation and treatment from their personal provider at their expense
    ii. Educational material regarding general information, potential hazards, universal precautions and personal hygiene
    iii. Other potential health and safety hazards

2. Ancillary Personnel

a) Ancillary personnel are those employees who do not have direct/substantial animal contact in their daily job functions, but who may need to enter an animal area in the course of performing their duties.
b) Ancillary personnel will be provided, by their supervisor or designee, information based on their need for entry into animal care facilities.

    i. The availability of, and the option to request medical evaluation and treatment of a medical condition
    ii. Educational material regarding general information, potential hazards, universal precautions and personal hygiene
    iii. Other potential health and safety hazards

SECTION III: PROGRAM PROCESS

Step 1: Faculty, staff, principal investigators and students involved in the use of animals must review the Guidelines for Occupational Health and Safety in the Care and Use of Animals

Step 2: Departments, supervisors, and principal investigators identify and require personnel who have substantial contact with animals to participate in the Occupational Health and Safety in the Use of Animal Program. This is done primarily through review of the functional demands and environmental factors associated with the work to be performed (position description, class or project).

Step 3: The supervisor/department/PI, in coordination with the FOM Attending Veterinarian completes a Hazard and Risk Assessment (Appendix B) for the project/class/protocol and gives a copy to each person working with animals in his or her lab, class or facility. For work involving infectious agents, biological risk assessment (Appendix E) must be performed to identify and address potential risks before the commencement of the work. These forms need to be completed only one time for each individual under their supervision, unless one or more of the following has changed: duration of animal exposure, type of activity, equipment used, chemical, type of animal and/or change in the individual's health status. PIs/supervisors maintain a copy of this assessment in the student's file and forward a copy to AEU.

Step 4: After the supervisor reviews the Hazard and Risk Assessment with the individual who works with animals, the individual will need to complete the Medical Evaluation Form (Appendix C) and Animal Contact Health Questionnaire (Appendix D).

Step 5: The individual will be sent to Student Health Clinic or UM Panel Clinics or Private Clinics for medical evaluation.

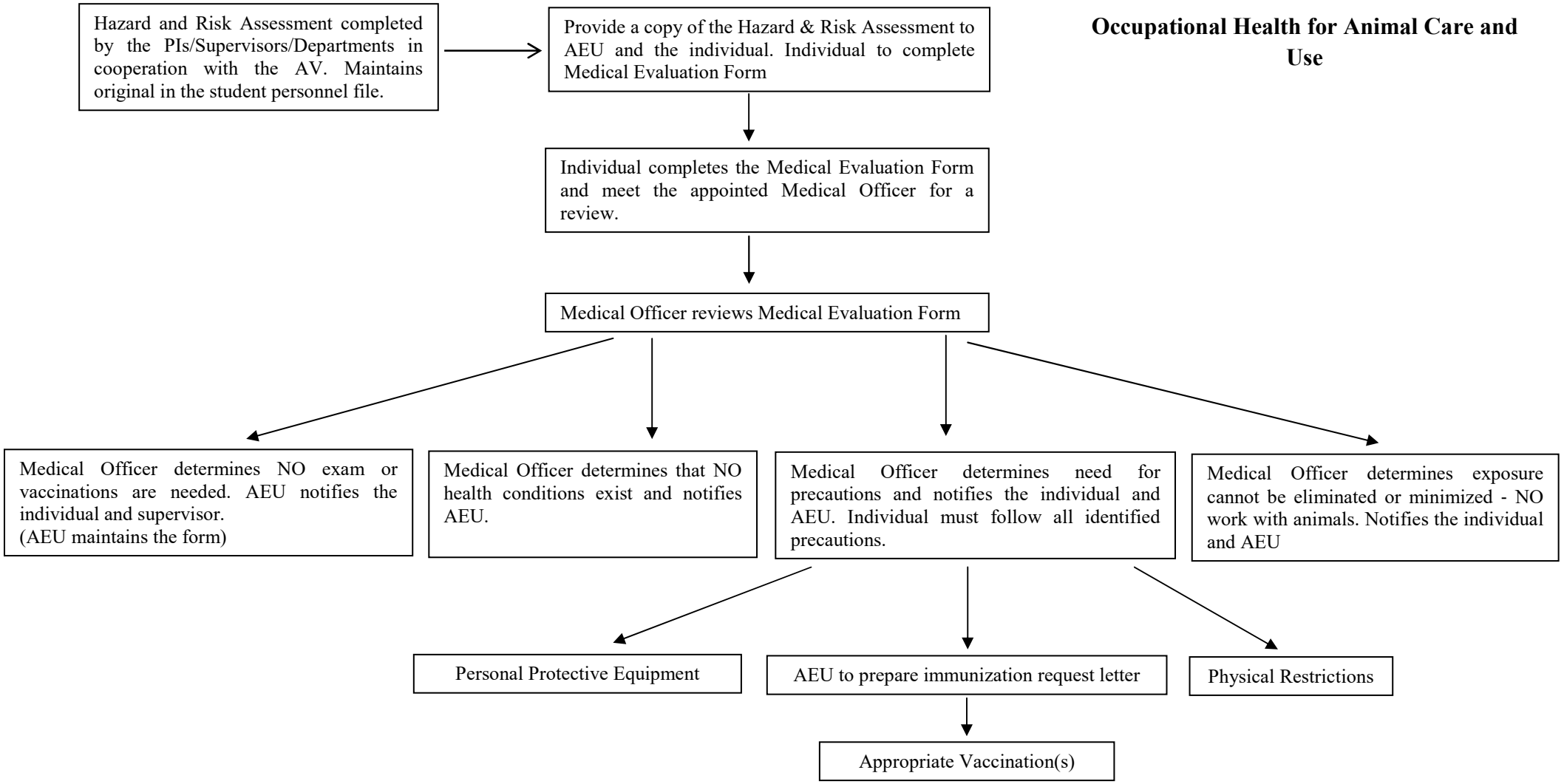
- Please bring vaccinations records to assist in completing the Health Assessment Form.
- The individual must complete both, the Medical Evaluation Form for Animal Contact (Appendix C) and Animal Contact Health Questionnaire (Appendix D).
- The Medical Officer will review the assessment and make recommendations.
- If an examination is recommended, the Medical Officer will indicate in the form. Individuals needing the exam must participate in the medical examination/vaccinations.

- If the Medical Officer recommends vaccinations only, individual must participate unless supporting documentation can be provided for not completing the recommended vaccinations.
- The Individual will return the Medical Evaluation Form for Animal Contact to the AEU.
- AEU will maintain information in a database.
- AEU will forward any precautions or preventive measures to the supervisor/department/PI.
- Supervisor/department/PI will implement any and all precautions or preventive measure outlined by the Medical Provider.
- Employee is required to comply with precautions or preventive measures outlined by the Medical Provider.

Step 6: AEU will maintain a database for all individuals and send out a report annually to all supervisors/departments/PIs. Re-evaluation is based on the nature of the hazards (respirators, substantial risk areas, etc.) and when there are changes in work assignments (change in species, contact level, etc.). These hazards and risks will be determined by the supervisor, principal investigator, faculty, etc.

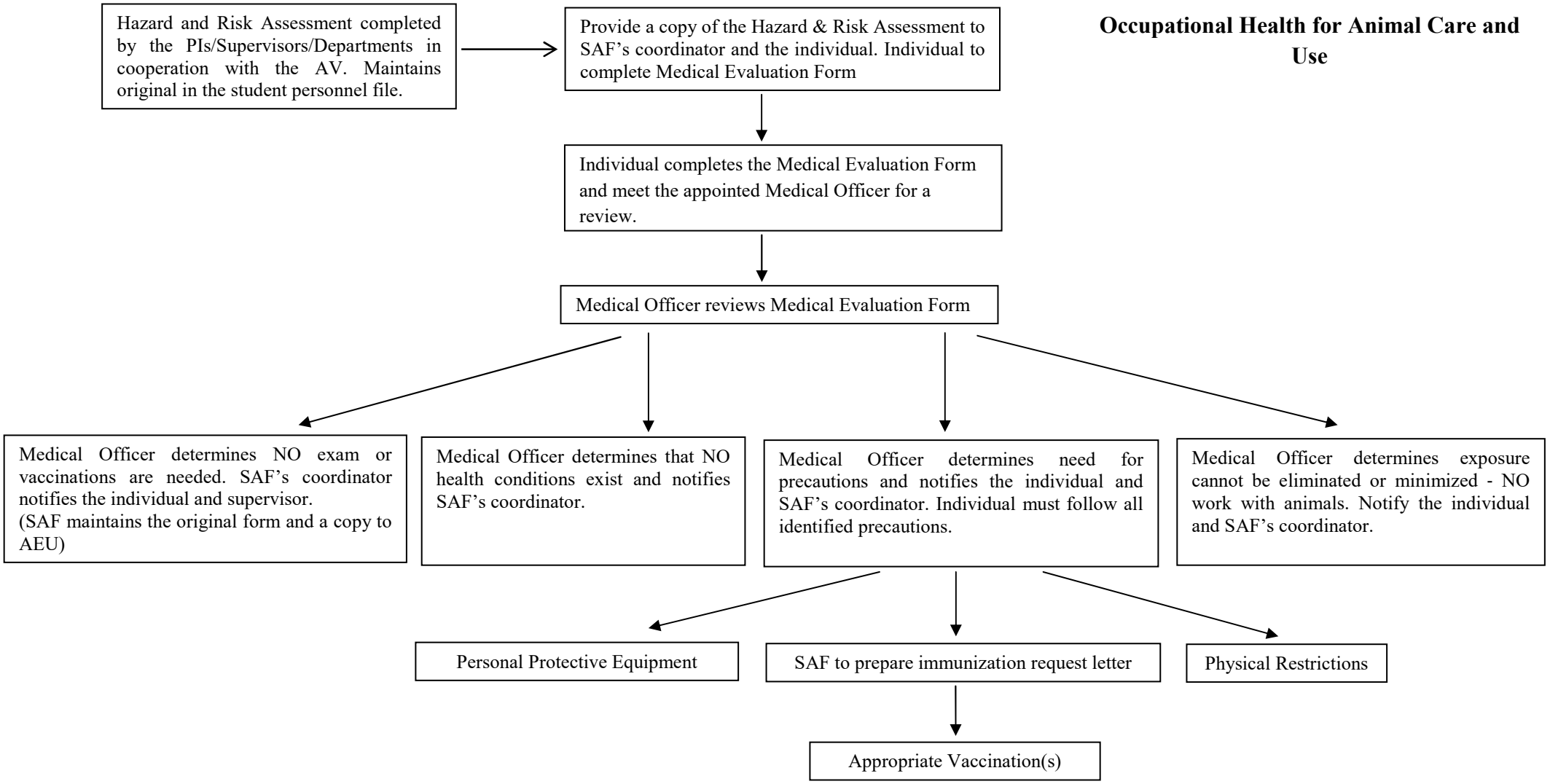
Step 7: Complete all University required training prior to beginning work and annually thereafter.

Program Process Flowchart for AEU



All forms will be maintained in the AEU Office | Database maintained by AEU

Program Process Flowchart for Satellite Animal Facility (SAF)



All forms will be maintained in the SAF office and a copy to AEU	Database maintained by both, SAF and AEU

SECTION IV: PROGRAM EVALUATION

The program for occupational health and safety in the care and use of vertebrate animals is evaluated annually through the mechanism of the IACUC Semiannual Program Review. Documentation of this self-evaluated Semiannual Program Review (which becomes part of the Semiannual Report to the Institutional Official) is maintained in the IACUC Office. The IACUC Chairperson and IACUC members conduct the Semiannual Program Review.

This review asks the IACUC to consider, evaluate, and make certain that the following elements are part of an institutional animal care and use occupational health and safety program.

The evaluation asks whether the program:-

- Is established and implemented
- Covers all personnel who have substantial contact with animals
- Is based on hazard identification & risk assessment
- Includes personnel training with information on topics like zoonosis, hazards, health precautions, etc.
- Includes personal hygiene procedures (e.g., work clothing, eating/drinking/smoking policies)
- Has procedures for use, storage, and disposal of hazardous biological, chemical, and physical agents
- Includes specific procedures for personnel protection (e.g., shower/change facilities, injury protection)
- Involves evaluation including health history for personnel with substantial contact with animals
- Offers immunizations as appropriate (e.g. rabies, tetanus) and tests zoonosis surveillance as appropriate
- Includes procedures for reporting and treating injuries, including bites, etc.

After the evaluation has been conducted, any deficiencies, problems, or suggestions for improvement regarding the animal care and use occupational health and safety program are brought to the attention of the IACUC and the Institutional Official for discussion and action.

APPENDIX A

UNIVERSITY OF MALAYA
ANIMAL EXPERIMENTAL UNIT

Animal Experimental Unit (AEU)
Block L, Faculty of Medicine
University of Malaya
50603 Kuala Lumpur.
Tel : 03 - 7967 4770/4768/7564
Fax : 03 - 7967 7894

INCIDENT REPORT FORM		
INFORMATION ABOUT THE PERSON INVOLVED IN THE INCIDENT:		
Full Name :		
NRIC/Matric Card No. :		
Level of Study (Undergraduate/Master/PhD/Others) :		
Department/Faculty :		
Phone :	Mobile :	Email :
Supervisor/Principal Investigator's Name :		
Department/Faculty :		
Phone :	Mobile :	Email :
INFORMATION ABOUT THE INCIDENT:		
Date of Incident :	Time of Incident :	
Location of Incident :		
Date and Time AEU staff being notified :	Name of AEU staff :	
Describe what happened, how it happened, factors leading to the event, substances or objects involved. Be as specific as possible (attach separate sheet if necessary) :		
Were there any witnesses to the incident? Yes No If yes, attach a separate sheet with names, addresses and phone numbers, or campus dept and phone.		
Was the individual injured? If so, describe the injury (laceration, sprain, etc.), the part of the body injured and any other information known about the resulting injury(s):		
Was medical treatment provided? Yes No Refused If so, where (circle) : Emergency Room The Workplace Walk-in Clinic Other :		
Will the employee miss time from work as a result of this incident? Yes No Unknown		
REPORTER INFORMATION		
Name of Reporter :		
Reporter Signature :		
Date Report Completed :		

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APPENDIX B

UNIVERSITY OF MALAYA
ANIMAL EXPERIMENTAL UNIT

Animal Experimental Unit (AEU)
Block L, Faculty of Medicine
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50603 Kuala Lumpur.
Tel : 03 - 7967 4770/4768/7564
Fax : 03 - 7967 7894

HAZARD & RISK ASSESSMENT

This form is completed for the purpose of conducting an occupational health risk assessment for the participant. This form will be used in conjunction with the Medical Evaluation Form to evaluate for appropriate medical surveillance.

Completion of this form for each individual involved in our animal care and use program is required by the principal investigator and supervisor in order to aid in determining appropriate training courses and necessary health precautions to minimize the potential for animal- related health risks to FOM employees and students assigned to animal facilities and projects. This form needs to be completed only one time for each individual under their supervision unless one or more of the following has changed: the duration of animal exposure, the type of activity, the type of animal and/or a change in the individuals, health status. A faculty principal investigator may complete his/her own risk assessment.

Faculty/Staff/Student's Name : _____

Department : _____

Phone No : _____

Nature of Work/Job Title : _____

PI Assessment of Potential Work-Related Health/Safety Issues:

All Animals to be encountered according to the following designations:
Level 0 No animal contact
Level 1 No direct contact, but enters animal facility
Level 2 Does not conduct procedures on live animals but handles "unfixed" animal tissues and fluids
Level 3 Handles, restrains, collection of specimens or administers substances to live animals.
Level 4 Performs invasive procedures such as surgery, necropsy

Gerbil _____
Mice _____
Rabbit _____
Rat _____
Other _____

Will work involve direct contact with any of the following?

1. Biological Agents
   a. Recombinant DNA Yes No
   b. Infectious Agents Yes No

2.	Human Blood, Tissues, or Cells	Yes	No
3.	Physical Agents		
	a. Caustic, Flammables or cryoagents	Yes	No
	b. Noise	Yes	No
	c. Radiation	Yes	No
	d. Radioisotopes	Yes	No
	e. Extreme environmental conditions	Yes	No
	f. Lasers	Yes	No
4.	Chemical Agents		
	a. Anesthetic gases	Yes	No
	b. Drugs/Chemotherapeutic agents	Yes	No
	c. Heavy metals	Yes	No

PI/Supervisor's determination of special preventative measures or actions to be taken for this individual's animal-related work.

1. Training courses

Baseline Safety Training	_____
IACUC Training	_____
Occupational Health & Safety Program	_____
Chemical/Lab Safety Training	_____
Radiation Safety Training	_____
Laser Safety Training	_____
Exposure Control Plan	_____
Other Protocol Specific Procedures	_____

2. Health Assessment, immunizations/vaccinations
3. Personal protective equipment like gloves, clothing, respirators, etc.
4. Avoiding contact with certain species, etc.

List other:

By signature, I certify that the information provided is accurate, that I have provided the participant in Section A with the AEU plan on the Animal Care and Use Occupational Health Program, and that I have provided necessary training on the items detailed in that program and as specified in this form.

PI, Supervisor, or Dept. Head's Name (please print): _____

Signature of PI, Supervisor, or Dept. Head: _____ Date:_____

Note:

- Provide a copy to the employee and AEU (Fax: 03-7967 7894) – then send an individual copy to AEU to complete the Medical Evaluation Form.
- Retain a copy within your departmental employees' files

APPENDIX C

UNIVERSITY OF MALAYA
ANIMAL EXPERIMENTAL UNIT

Animal Experimental Unit (AEU)
Block L, Faculty of Medicine
University of Malaya
50603 Kuala Lumpur.
Tel : 03 - 7967 4770/4768/7564
Fax : 03 - 7967 7894

REQUEST FOR MEDICAL EVALUATION FOR ANIMAL CONTACT

Section A: COMPLETED BY REQUESTING RESEARCHERS, STAFF OR STUDENTS

Employee /Student's Name (please print): _____

Staff /Student's Matric No: _____ Date of birth: _____

Position/Job Title: _____ Work Tel. No.: _____

Department/Faculty: _____

Supervisor's Name (Print): _____ Supervisor Tel. No.: _____

Hazardous agents: ☒ Animals ☐ Other, please specify

_____

Type of animal	Mice	Rabbits	Rats	Others
Contact hours/week				

Special work considerations (e.g., lifting requirements, other protective clothing which may add stress): _____

_____ _____

Supervisor's signature

Section B: COMPLETED BY MEDICAL OFFICER

Employee name: _____

Assessment: ☐ Initial ☐ Revision number _____

☐ The individual is medically qualified to work with the animals noted above without limitations/restrictions.

☐ The individual is medically qualified to work with the animals noted above with the following limitations or restrictions: _____

☐ The individual is currently NOT medically qualified to work with the animals noted above.

☐ Please have the individual contact the University of Malaya panel clinics for staff or Student Clinic, UMMC or private clinic for students to schedule additional examinations.

☐ Other comments: _____

Evaluator's signature: _____ Date: _____

Name (please print): _____

Official stamp:

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APPENDIX D

UNIVERSITY OF MALAYA
ANIMAL EXPERIMENTAL UNIT

Animal Experimental Unit (AEU)
Block L, Faculty of Medicine
University of Malaya
50603 Kuala Lumpur.
Tel : 03 - 7967 4770/4768/7564
Fax : 03 - 7967 7894

MEDICAL CONFIDENTIAL
ANIMAL CONTACT HEALTH QUESTIONNAIRE

Employee/Student's Name (please print):_____

Staff /Student's Matric No: _____ Date of Birth: _____

Position/Job Title: _____ Work Tel: _____

Department /Faculty: _____

Supervisor Name: _____ Supervisor Tel No.: _____

How would you describe your health? ☐ Excellent ☐ Good ☐ Fair ☐ Poor

Each of the following questions should be answered "NO" or "YES."
"YES" answers should be clarified and described in more detail in the space provided.

Do you have now or have you ever had any of the following:	NO	YES	Please explain all the 'YES' answers
1. Eczema, rash, hives or other skin problems			
2. Rheumatic fever or rheumatic heart disease			
3. Heart murmur or disorder of the heart valve			
4. Asthma or other chronic pulmonary disease			
5. Splenectomy, absent or non-functioning spleen			
6. Sickle cell anemia			
7. Recently taken medications which might suppress the immune system (for example, prednisone, cortisone, chemotherapy)			
8. Chronic medical problem that might suppress the immune system (for example, cancer, leukemia, lymphoma, diabetes, HIV or AIDS, tuberculosis, liver or kidney disease, alcoholism)			
9. Allergies to medicines			
10. Allergies to any animals			
11. Skin test for allergies			
12. Other allergies			
13. Tetanus booster (give date of most recent)			
14. Hepatitis B vaccine 3 dose series : date of most recent			

Please note the weekly hours of contact with each type of animal and any symptoms experienced.

Types of Animal	Contact Hours/week	Symptoms						
		Asthma	Cough	Congestion	Runny nose	Short of breath	Skin rash	Other (specify)
Mice								
Rabbits								
Rats								
Other (specify)								

I certify that the above is accurate and true to the best of my knowledge.

_____ _____
SIGNATURE DATE

Note: All medical records and test results are considered MEDICAL CONFIDENTIAL.

If you have any queries, please contact the Animal Experimental Unit (AEU), Faculty of Medicine, University of Malaya, Kuala Lumpur. Tel: 603 – 7967 4770/7577/7564

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APPENDIX E

UM/IBBC/ANNEX 1
BIOLOGICAL RISK ASSESSMENT FORM

For IBBC use only	
Registration no.:	
Date received:	

UNIVERSITY OF MALAYA
KUALA LUMPUR
The Leader In Research and Innovation

INSTITUTIONAL BIOSAFETY & BIOSECURITY COMMITTEE (IBBC)
UNIVERSITI MALAYA

BIOLOGICAL RISK ASSESSMENT FORM

For Activities Involving the Use of Infectious and Potentially Infectious Agents/Materials and Biological Toxins

Project title :

Principal Investigator (PI) :

Date :

This form is to be completed and submitted together with the NOI submission.

PART A: POTENTIAL BIOHAZARDS

1. Agent(s) used :

2. Risk group of agent(s) (refers to Akta Pencegahan Dan Pengawalan Penyakit Berjangkit 1998):
   ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ Unknown

3. Quantity used (mL or g):

4. Is this agent infectious to human? ☐ Yes ☐ No

   If yes, please specify the following:

   i. Disease caused by the agent

   ii. Symptoms associated with the disease

iii. Modes of transmission

iv. Host range of the agent

v. Types of effective treatment

vi. Preventive control measures

5. Is immunization required or recommended when working with this agent? ☐ Yes ☐ No

If yes, please specify.

PART B: PHYSICAL CONTAINMENT FACILITIES

1. Where will the proposed work be conducted?

2. What biosafety laboratory level is required?

3. Will the agent be stored in the working environment? ☐ Yes ☐ No

If yes, specify the storage details: ☐ Fridge ☐ Freezer ☐ Incubator

Others (please specify) :

4. Will there be proper labeling of all agent ? ☐ Yes ☐ No

If yes, how will the agent be labeled?

5. Will there be a need to transport the agent within facility and between institution?

☐ Yes ☐ No

If yes, state the method of transportation.

PART C: PROCEDURES AND RISK CONTROLS

1. What procedures will be used with the agent?

☐ Aspiration ☐ Pipetting ☐ Pouring ☐ Shaking/Mixing
☐ Grinding ☐ Centrifugation ☐ Culturing ☐ Slide preparation

Others (please specify) :

2. Will any of the procedures potentially generate aerosol? ☐ Yes ☐ No

If yes, state the procedures that can potentially generate aerosol

3. Where will the aerosol generating procedures be performed?

List the biosafety practices taken to minimise the exposure due to procedures that will generate aerosol.

4. Are there written procedures for handling accidents and/or spills? ☐ Yes ☐ No
If yes, state the procedures for handling accidents and/or spills.

5. Are there appropriate tools and supplies to handle accidents and/or spills? ☐ Yes ☐ No
If yes, state the appropriate tools and supplies to be used.

6. Are there washing facilities for use in case of accidents and/or spills? ☐ Yes ☐ No
If yes, state the washing facilities to be used.

7. Are there written procedures for handling hazardous biological material? ☐ Yes ☐ No

If yes, state the written procedures for handling hazardous biological material

8. Are there appropriate sterilization/autoclaving facilities available? ? ☐ Yes ☐ No

If yes, state the washing facilities to be used.

PART D: PROPOSED CONTROLS AGAINST BIOHAZARDS

1.

☐ 3-ply mask	☐ N95	☐ Respirator	☐ Goggles
☐ Gloves	☐ Lab coat	☐ An apron	☐ Tyvek
☐ Shoe covers	☐ Booties	☐ BSC Type II	☐ BSC Type III

Others (please specify) :

2. State when each protective device is required.

3. Is the BSC certified annually? ☐ Yes ☐ No

4. Has proper biosafety training been provided? ☐ Yes ☐ No
   If yes, submit evidence of training attended and a copy of training programme.

5. Has job specific training been provided? ☐ Yes ☐ No
   If yes, submit evidence of training attended and a copy of training programme.

6. State any other containment controls required

Signature and stamp of PI

Date

FOR IBBC OFFICIAL USE ONLY

Remarks by Institutional Biosafety & Biosecurity Committee:

Signature of IBBC Chairman:

Date:

Adapted from: Biological Risk Form of TIDREC, UM, September 2013

WORKS CITED

a) Biosafety in Microbiological and Biomedical Laboratories. Centers for Disease Control-National Institutes of Health, 2009.
http://www.cdc.gov/biosafety/publications/bmbl5/BMBL.pdf

b) Guide for the Care and Use of Laboratory Animals (8^{th} edition.). Institute of Laboratory Animal Resources. National Research Council. National Academy Press, 2011.

c) NSDU Guidelines for Occupational Health & Safety, 2011