

2010 version of the Guide for the Care and Use of Laboratory Animals

Research Administration



Purpose of presentation -Educational outreach

- Detail information from publication as all OLAW assured institutions must base their program on the *Guide*
- OLAW uses the *Guide* to apply standards to achieve specified outcomes
- These outcomes are clear practice and engineering standards that will have a direct impact on the well-being of animals
 - policies and procedures
 - animal and veterinary care
 - program management and oversight
 - occupational health and safety
 - IACUC functions
 - animal facility design and management
- Will highlight aspects of the Guide and point out updates and clarifications



Chapter 1 Definitions

- **Laboratory animals** - any vertebrate animal (e.g., traditional laboratory animals, farm agricultural animals, wildlife, and aquatic animals) species produced for or used in research, teaching, or testing.
- **Animal use** - the proper care, use and humane treatment of laboratory animals produced for, or used in research testing or teaching.
- **Humane care** - those actions taken to assure that laboratory animals are treated according to high ethical and scientific standards.
- **Animal care and use program** - the policies, procedures, standards, organizational structure, staffing and practices put into place by an institution to achieve humane care of animals in the laboratory and throughout the institution.
- **Engineering standard** - standard or guideline that specifies a method, technology or technique for achieving a desired outcome. Are prescriptive, provide limited flexibility for implementation, useful to establish a baseline.
- **Performance standard** - standard or guideline that, while describing a desired outcome, provides flexibility in achieving this outcome. Grants responsibility to those managing the animal care and use program (the IACUC, researcher, ID, etc.). Desired outcomes and/or goals are clearly defined and appropriate performance measures are regularly monitored to verify success of the process.
- **Practice standard** - application of professional judgment by qualified, experienced individuals to a task or process over time which benefits or enhances animal care and use. Professional judgment comes from information obtained from the peer-reviewed scientific literature and textbooks.
- The verb **must** indicates actions that the Committee to Update the Guide considers to be imperative and are a mandatory duty or requirement for providing humane animal care and use.
- The verb **should** indicates a strong recommendation for achieving a goal, however, the Committee recognizes that individual circumstances might justify an alternative strategy.
- The term **may** indicates a suggestion to be considered.



Use of the Guide


- **“It is intended that the Guide be read by the user in its entirety...”** meaning one should be familiar with all the key concepts in the publication
- Guide recommendations may be different from governmental statute and regulations or what is institution specific. In these areas of differences, the higher standard should apply.



Chapter 2


Guide considers US government principles

- Consideration of alternatives (in vitro systems, computer simulations and/or mathematical models) to reduce or replace the use of animals
- Research procedures are designed to be relevant to human or animal health, advancement of knowledge, or the good of society
- Research use appropriate species, quality, and number of animals
- Procedures avoiding or minimizing discomfort, distress, and pain while using appropriate sedation, analgesia, and anesthesia
- Humane endpoints be established
- Adequate veterinary care to be provided as well as appropriate animal transportation and husbandry by qualified persons
- Experiments conducted under the close supervision of qualified and experienced personnel

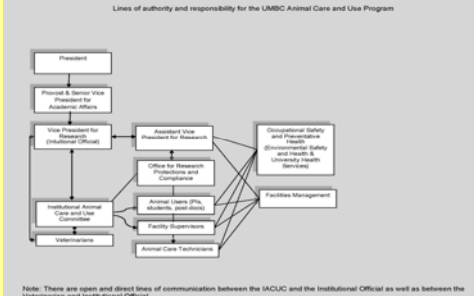


Replacement, Refinement, & Reduction

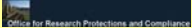
- The Guide endorses the responsibilities of investigators as stated in federal regulations. **All investigators must use the ethical considerations found in the 3-R's (Replacement, Refinement, & Reduction) as a starting point in the design of research.**
 - Replacement refers to methods that avoid using animals
 - Refinement refers to modifications of husbandry or experimental procedures to enhance animal well-being and minimize or eliminate pain and distress
 - Reduction includes strategies for obtaining comparable levels of information from the use of fewer animals or for maximizing the information obtained from any given number of animals (without increasing pain or distress) so that in the long run fewer animals are needed to acquire the same scientific information



Animal Care and Use Program oversight

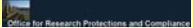


Note: There are open and direct lines of communication between the IACUC and the Institutional Official as well as between the Veterinarian and Institutional Official



Institutional Official Responsibilities

- representative of senior administration
- bears ultimate responsibility for the animal care and use program
- responsible for resource planning and ensuring alignment of animal care and use program goals with the institution's mission



Investigator responsibilities

- conduct of the research
- has the precise knowledge of both the objectives of the study
- should identify and explain in the protocol a study endpoint that is both humane and scientifically sound



Institutional Animal Care and Use Committee Responsibilities

- should have sufficient authority and be provided with resources (e.g., staff, training, computer resources) to fulfill the responsibility
- awareness of the *Guide's* endorses the American College of Laboratory Animal Medicine's (ACLAM) for the provision of appropriate and competent veterinary care
- Program review and inspections should occur at least annually (or more often if required by PHS Policy) – every six months.
- Ensure there is a disaster plan - Facilities must have a disaster plan; animals that cannot be protected from the disaster must be humanely euthanized.



Attending Veterinarian Responsibilities

- responsible for the health and well-being of all laboratory animals
- must sufficient authority from the institution, have access to all animals, and sufficient resources to manage the program of veterinary care
- oversees other aspects of animal care and use (e.g., husbandry, housing) to ensure that the program complies with the *Guide*.



Elements of the UMBC Animal Care and Use Program

- Program
- IACUC POLICIES AND RESPONSIBILITIES
 - Institutional Animal Care Program - appointment of IO and IACUC and IACUC Chair, details of IACUC responsibility, animal care and review protocol procedures, reviews of concerns and allegations, suspension of animal activities, daily management of facilities, reporting of adverse events. Committee members with a conflict of interest must recuse themselves when a protocol is reviewed. Facilities must have a disaster plan with individuals identified and training provided in advance of implementation.
- IACUC RECORDS AND REPORTING REQUIREMENTS
 - Record retention
 - Semi-annual review and inspection
 - Governmental reporting requirements
- VETERINARY CARE
 - Oversight responsibilities of veterinarians
- INSTITUTIONAL TRAINING PROGRAMS, HEALTH & SAFETY
 - Ongoing training and instruction programs and content areas for IACUC members, investigators and staff, occupational safety and health (risk assessment, hazard identification), post-approval monitoring provides ongoing protocol assessment and ensures regulatory compliance and creates an educational tool



Elements of the UMBC Animal Care and Use Program

Facilities

- Housing
- Temperature and Humidity
- Ventilation
- Illumination
- Noise
- Food
- Water
- Bedding
- Sanitation
- Waste Disposal
- Pest Control
- Emergency, Weekend, and Holiday Care
- Population Management
- Quarantine, Stabilization, and Separation
- Surveillance, Diagnosis, Treatment, and Control of Disease
- Surgical Facilities
- Pain, Distress, Analgesia, and Anesthesia
- Euthanasia
- Facility Access and Security

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Development of procedures

- Institutions are encouraged to *establish and periodically review written procedures* to ensure consistent application of Guide standards and also the constantly evolving body of literature related to animal science and use of animals
- Programs should remain current with information and best practices
- Inter-institutional collaboration has the potential to create ambiguities regarding responsibility for animal care and use. Procedures should be developed to create a formal written understanding (e.g., contract, memorandum of understanding or inter-institutional agreement) between the institutions.
- Should address the responsibility for offsite animal care and use, animal ownership and IACUC review and oversight and who may choose to review protocols for the work being conducted.
- All personnel must be adequately educated, trained and/or qualified in basic principles of lab animal science and animal well-being.
- Continuing education programs should be offered to reinforce training and provide updates that reflect changes in technology
- Reporting procedures for
 - animal welfare concerns
 - potential threats such as personnel harassment and assault, and facility trespassing, arson, and vandalism

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Training

- IACUC members should take advantage of training opportunities to understand work and role
- All personnel must be adequately educated, trained and/or qualified in basic principles of lab animal science and animal well-being.
 - Includes regulations, IACUC function, ethics and the 3 Rs, reporting concerns, occupational health, husbandry, handling, asepsis, anesthesia and analgesia, and euthanasia
- Options available
 - Online (CITI)
 - accredited programs in veterinary technology
 - Certification programs for laboratory animal technicians and technologists
 - local and national laboratory animal science meetings
 - On-the-job
- Continuing education programs should be offered to reinforce training and provide updates that reflect changes in technology

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Occupational Health and Safety

- Each institution must establish and maintain an Occupational Health and Safety Program
- must be consistent with federal, state, and local regulations and should focus on maintaining a safe and healthy workplace
- Personnel should have protections in place
 - be informed that control and prevention strategies begin with the identification of hazards and the assessment of risk associated with those hazards
 - Identify (ergonomic injuries allergen exposure) and assess risks (employee health evaluations)
 - Manage risks (procedures and PPEs)
 - Look at facilities to see if appropriate personal hygiene is followed
- Design of experimental procedures should look at risks and reduce to minimal and acceptable levels
- Operational and day-to-day responsibility for safety in the workplace resides with the laboratory or facility supervisor (e.g., principal investigator, facility director)

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Chapter 3 Facilities, Housing and Environment

- *Guide* provides guidelines for design of facilities for appropriate animal housing and management
- environments should be well-suited for the species or strains, and take into account their physical and behavioral needs
- Essential for:
 - quality of animal research
 - teaching
 - health and safety of personnel

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Environmental considerations – general information

- Animals should be housed within temperature ranges appropriate for the species and be provided with the means to regulate their own temperature
- Humidity should also be controlled, but not nearly as narrowly as temperature for many mammals
- Frequent ventilation and air exchange provides appropriate air quality and a stable environment
 - recycled air may save energy but might have risk of transmitting animal pathogens or infections
- Type of and intensity of light, noise produced by animals and animal-care activities and amount of vibration impacts animals as well as the operation of a facility
- **Promote safe working conditions for personnel**

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Environments for animals - terrestrial species

- All animals should be housed under conditions that provide sufficient space as well as supplementary structures and resources required to meet social interaction, physical, physiologic, and behavioral needs
 - New rodent housing space recommendations provided, particularly for female mice/rats with litters
 - Social housing of incompatible can induce stress and injury (male mice more prone to aggression than female)
- Animals should be provided with adequate bedding substrate and/or structures for resting and sleeping
 - For rodents - foraging, digging, burrowing, nest building
- Environmental enrichment to enhance animal well-being (such as wooden chew sticks for rodents) should be considered as long as it does not compromise experiments
- The veterinarian, animal user, and IACUC should be involved in decisions about animal housing and enrichment

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Husbandry of terrestrial animals

- Food, when purchased, should be free of diseases, parasites, and chemical contaminants – stored off the floor
- Uncontaminated drinking water delivered via watering devices (sipper tubes, automatic waterers) should be checked frequently
- Appropriate bedding should be selected and properly stored
 - Mice exhibit preference for specific materials
- Good sanitation and cleaning practices will provide healthy environment
 - Soiled bedding should be removed and replaced with fresh materials as often as is necessary to keep the animals clean and dry and reduce pollutants, such as ammonia
 - Solid-bottom caging, bottles, and sipper tubes usually require sanitation at least once a week using hot water (143- 180 ° F or above) and detergents at washing times to eliminate opportunistic and pathogenic organisms
 - Mechanical washers should be evaluated regularly
 - All components of the animal facility should be cleaned regularly cleaned and disinfected
- Animals should be cared for by qualified personnel every day, including weekends and holidays; emergency veterinary care must be available after work hours, on weekends, and on holidays
- Personnel should be trained on emergency procedures

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Environments for animals – aquatic species

- Water quality and life support systems for aquatic animals will vary with the species, life stage and biomass (plants) supported but should be stable and balanced
 - can directly impact animal wellbeing
 - routine water quality testing is essential
- Standards for acceptable water quality, temperature, pH, alkalinity, etc. should be set by institution (and based on species)
- Three types of life support systems for water which require a level of filtering:
 - re-circulating (moved around a system)
 - flow-through (constantly replaced)
 - static systems (stationary/ periodically replaced)
- Water temperature may be controlled at its source but rooms where housed may impact temperature and moisture of area
- Aquatic species are sensitive to light and noise

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Husbandry of aquatic animals

- Allow for the normal physiological and behavioral needs, including excretory, body temperature, social interactions, normal movement
- Allow access to adequate food and removal of food waste
- Restrict escape or accidental entrapment of animals or their appendages
- Ensure area is free of sharp edges and/or projections that could cause injury
- Basic concepts of sanitation are the same for terrestrial and aquatic systems
- As with terrestrial species, daily care should be provided to animals by qualified personnel

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Chapter 4 Veterinary Care

- Veterinary care is an essential part of an animal care and use program
- Primary focus of the veterinarian is to oversee the well-being and clinical care of animals
- Additionally, updated *Guide* shows responsibilities for:
 - procurement and transport
 - quarantine
 - biosecurity
 - surveillance
 - pain and distress

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Role of veterinarian

- Attending Veterinarian - is certified or has training or experience in laboratory animal science and medicine or is otherwise qualified in the care of the species being used
- The veterinarian **should provide guidance to investigators and all personnel involved in the care and use of animals** to ensure appropriate husbandry, handling, medical treatment, immobilization, sedation, analgesia, anesthesia, euthanasia, surgery and oversight of postsurgical perioperative care

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Animal Procurement

- Investigators should confirm with the facility prior to ordering animals and should be linked to an approved IACUC protocol
- People responsible for shipping/receiving should be trained to minimize transport times and delivery should be during normal business hours
- Immunocompromised, genetically modified, and specific pathogen free rodent is of importance for ensuring animal biosecurity

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Biosecurity and preventive medicine

- Disease prevention is essential in veterinary medical care - maintains healthy animals and minimizes animal waste and potential effects on well-being. Procedures must be in place to provide for emergency veterinary care both during and outside of regularly scheduled hours.
- Appropriate procedures should be in place for disease surveillance and diagnosis. Unexpected deaths and signs of illness, distress, or other deviations from normal in animals should be reported promptly to vet and investigated, as necessary, to ensure appropriate and timely delivery of veterinary medical care
- Biosecurity - all institutional measures taken to identify, contain, prevent, and eradicate known or unknown infections that may disease, alter animal physiology and make animals unsuitable for research

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Quarantine and Surveillance

- An effective quarantine program minimizes the chance for risk of introduction of pathogens into an established colony
- All animals should be observed for signs of illness, injury, or abnormal behavior by a person trained to recognize such signs.
 - As a rule, this should occur at least daily, but more frequent observations may be required
 - Document, document, document


Surgery

- Researchers conducting surgical procedures must have had appropriate training to ensure that good surgical technique is practiced
- Training may have to be tailored to accommodate the wide range of educational backgrounds frequently encountered in research settings (i.e. Technical staff performing rodent surgery may have had little formal training and may require general surgical training as well)

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Chapter 5 Animal Facilities

- A well-planned, well-designed, well-constructed, properly ***maintained and managed*** facility is an important element of humane animal care and use, as it facilitates efficient, economical, and safe operation
- Effective planning and design should include input from personnel experienced with animal -facility design, engineering and operation ***as well as from users of the proposed facility***
- ***Automated monitoring systems***, which notify personnel of excursions in environmental conditions, including temperature and photoperiod, ***are advisable*** to prevent animal loss or physiologic changes which may occur as a result of system malfunction
- Access should be strictly controlled and limited to people who have a legitimate reason for access to the facility. When possible, the animal facility should be located within another structure with its own set of security features
- ***As animal model development and use changes during the life cycle of an animal facility, facilities should be designed to accommodate these changes***

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Animal Facilities - Location

- Quality animal facility management and human comfort and health protection require separation of animal facilities from personnel areas, such as offices and conference rooms
- Careful planning should make it possible to place animal housing areas next to or near research laboratories but separated from them by barriers, such as entry locks, corridors, or floors
- Location should account for noise and vibration within and surrounding the facility
- ***Animals should be housed in facilities dedicated to or assigned for that purpose and should not be housed in laboratories merely for convenience***
 - If animals must be maintained in a laboratory area to satisfy the scientific aims of a protocol, that space should be appropriate to house and care for the animals and use limited to the period during which it is required

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Animal Facilities – Functional Areas

- ***Professional judgment should be used to develop a practical, functional and efficient physical plant***
- Space is required for
 - Animal housing, care, and sanitation
 - Receipt, quarantine, separation, and/or rederivation of animals
 - Receiving and storage areas for food, bedding, biologics, and supplies
 - Separation of species or isolation of individual projects when necessary
 - Washing and sterilizing equipment and supplies
 - Storing wastes before incineration or removal or cold storage for disposal of carcasses
 - ***Specialized space for activities such as irradiation, preparation of special diets, experimental procedures, behavioral testing, imaging***
 - ***Barrier facilities for housing of specific pathogen free rodents or genetically modified animals***

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Animal Facilities

- Construction guidelines and specifications clarified and updated for
 - Corridors, windows and doors
 - Floors
 - Walls and Ceilings
 - HVAC
 - Power and lighting
 - Storage Areas
 - Noise Control and Vibration
 - Sanitization
 - Surgery
 - Barrier Facilities
 - Use of Hazardous Agents
 - Aquatic Species Housing

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