



## **CALAM/ACMAL Standards of Veterinary Care**

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- **Introduction**

These guidelines have been developed by the Canadian Association for Laboratory Animal Medicine/ L'association canadienne de la médecine des animaux de laboratoire (CALAM/ACMAL) to establish standards of veterinary care for laboratory animals\* used in research, teaching, and testing in Canada. They should assist institutions across the country in formulating and evaluating specific programs of veterinary care for laboratory animals. The professional judgement of a veterinarian trained and/or experienced in laboratory animal medicine is essential in the application of these guidelines. In addition to supporting the laboratory animal veterinarian's judgement, these standards acknowledge that adherence is required to guidelines, policies and relevant legislation established by other agencies and organizations. Such guidelines and legislation include the Veterinarian's Act, provincial legislation, and the Canadian Council on Animal Care (CCAC) Guide to the Care and Use of Experimental Animals - Volumes 1 and 2 and other guidelines. CALAM/ACMAL Standards of Veterinary Care are: 1) in accordance with provincial and federal legislation covering the humane treatment of animals (i.e. the Criminal Code of Canada; provincial animal welfare laws and regulations), 2) in accordance with Canadian provincial and federal regulations covering good conduct for veterinarians; and 3) are supported by the CCAC. The CCAC uses the CALAM/ACMAL "Standards of Veterinary Care" document as a guideline during assessments of institutional animal care and use programs and veterinary care of animals. CALAM/ACMAL recognizes that institutions may also have internal policies and procedures that may direct the veterinarian in the execution of their duties and responsibilities.

\*laboratory animal refers to any animal species maintained for the purposes of research, teaching, or testing and generally applies to vertebrates and some cephalopods

- **CALAM/ACMAL Status**

The Canadian Association for Laboratory Animal Medicine/L'association canadienne de la médecine des animaux de laboratoire (CALAM/ACMAL) is an association representing veterinarians in Canada working in the specialty of laboratory animal medicine. A need exists to provide a working description of standards of veterinary care that will serve as the framework for the implementation or delivery of programs in academic, government and private research institutions using animals in Canada.

- **CALAM/ACMAL's Position on Standards of Veterinary Care**

A veterinarian with authority and responsibility for supporting an institutional animal care and use program must be involved in all issues and activities that relate in any way to animal care and use. The institutional veterinarian(s) must be qualified by virtue of training or experience in laboratory animal science and medicine to perform in that capacity. The extent of the program of veterinary care will depend on several factors, such as the number and species of animals used and the nature of the research programs. The number of veterinarians necessary to fulfill the program's requirements and to ensure

that the CALAM/ACMAL Standards of Veterinary Care are met will vary by institution. In all cases, formal arrangements for the provision of veterinary care must be made to ensure that veterinary services are readily available at all times to meet both routine and emergency needs.

The veterinarian should report directly to a senior administrator of the institution (e.g. VP Research) and should not report only to the head of one faculty, department or research unit if veterinary services are required in more than one faculty, department or research unit. The responsibilities of the veterinarian(s) include:

- active participation by at least one veterinarian on the institutional animal care and use committee(s);
- regular visits of the animal facilities, followed by written reports forwarded to the senior administrator and the animal care committee. A minimum of two site visits per year should be conducted, and this number should be adjusted according to the size of the institution to monthly or more frequent visits conducted as the size, number of animals and/or specialized animal care and use programs dictates;
- availability of veterinary services at all times, during and outside of regular working hours. Animal care givers and users must be able to report animal injury, ill health or death at any time, and a veterinarian must be available to either treat the animal, investigate an unexpected death and/or to advise on euthanasia;
- development, implementation and oversight of an animal health program for each species maintained within an institution and maintenance of health records for each animal or group of animals. This must include measures taken to receive, quarantine/condition/acclimatize and introduce various species into the animal facilities;
- participation in the development/implementation/review of Standard Operating Procedures (SOPs) for animal care and use, and of institutional animal care and use policies. Participation in the development of SOPs for any invasive procedures (e.g. surgeries) is particularly important.
- participation in ongoing improvements in animal and veterinary care standards, guidelines and techniques through interaction with the animal care committee, senior administration, investigators and animal care staff;
- provision of advice to animal users and animal care givers, in particular on anesthesia and analgesia regimes, antibiotics, and other therapeutic agents. Animal users must be able to have direct access to veterinary advice when preparing animal use protocols, and to discuss any animal related issues, such as animal welfare, regulatory or health concerns;
- participation in the education and training of animal users and animal care givers.

The veterinarian must be responsible for and have authority; delegated by the senior institutional administrator and the animal care committee, to assure the provision of comprehensive veterinary care and to oversee all aspects of animal care and use. The veterinarian must be knowledgeable concerning the various uses of animals in the institutional research, testing and/or teaching programs. There must be a close relationship between the veterinarian and the local animal care committee and the veterinarian must be actively involved in the review of all protocols and projects and the institutional programs involving animals used in research, teaching and testing. There is a continuing institutional responsibility to foster and support improvement of the program through the identification and adoption of techniques, procedures and policies that will ultimately lead to better laboratory animal health and well-being and consequently, to good science and good research.

In order to accomplish this, the institution must support regular continuing education and training opportunities in experimental animal care and use for the veterinarian(s), such as participation in CALAM/ACMAL and Canadian Association for Laboratory Animal Science (CALAS/ACSAL) activities, access to laboratory animal medicine/ science journals and attendance at laboratory animal medicine/science courses and meetings (e.g., Charles River Short Course, American Association for Laboratory Animal Science {AALAS} conferences, etc), and CCAC and other laboratory animal science and medicine workshops.

The current CALAM/ACMAL Standards of Veterinary Care involves six primary areas of responsibility:

### **1) Animal Welfare**

This includes responsibility for the promotion and monitoring of an animal's welfare before, during and after experimentation or use in teaching. Animal welfare includes both physical and behavioural aspects of an animal's condition evaluated in terms of environmental comfort, freedom from pain and distress, and appropriate social interactions, both with members of the same species and with humans. The veterinarian must be responsible for making determinations concerning animal welfare, in collaboration with the animal care committee, the animal care staff and animal users. Authority must be sufficient to meet this responsibility and to assure projects receive institutional review. The veterinarian must have the authority to remove an animal from an experiment which is unduly affecting its well-being provided such an action is not specifically precluded in a project that has been reviewed and approved by the local animal care committee. While the number of animals housed and/or used may influence the type and extent of veterinary programs, the number of animals does not influence the application of these standards, ie, in terms of veterinary care, one animal is to be treated with the same ethical consideration and to have access to the same physical, physiological and behavioural conditions, the same health treatments and the same experimental and humane review as a hundred animals. The standards of veterinary care themselves remain constant. The following represents examples of how this responsibility can be met:

- Sourcing and procuring animals. Veterinarians should ensure that animals are ordered from reputable suppliers and that appropriate and humane transportation is used. The veterinary staff should evaluate health profiles of animals from non-commercial sources prior to importation of animals. Further, veterinarians are an important educational resource to animal users, the animal care committee members and the animal care personnel on issues associated with animal suppliers and sources including matters of public interest or concern.
- Provision of a physical plant, caging and ancillary equipment. Veterinarians must be consulted to determine the suitability of facilities available for all types of animal-based work to be conducted, and with respect to any renovations or construction of new facilities. They must also be consulted in regards to caging (traditional, non-traditional and specialized) and other housing and confinement matters pertaining to basic maintenance and experimental conditions. During their regular site visits, veterinarians must remain alert to any physical infrastructure deficiencies that need to be corrected to ensure humane animal care and use. These deficiencies, including space shortages, maintenance and repair of facilities and equipment, and improper use of facilities or equipment, must be reported to senior administration and to the animal care committee for resolution. Deviations from current standards of caging and housing must be approved by the animal care committee in consultation with the veterinarian prior to the animals' arrival.
- Ensuring that the basic physiological needs of the animals housed are met through the supply of quality feed, bedding, and other sundries necessary for the well being of the species. The veterinarian or designate, needs to ensure that these items are purchased from reputable suppliers and stored such that their quality is maintained and the supply is used prior to expiry dates. Veterinarians must be consulted in those cases where the research methodology requires feed and/or water restriction and prior approval of such restrictions must be obtained from the animal care committee and follow the pertinent institution's SOPs.
- Developing, implementing and monitoring sound animal husbandry programs including such areas as sanitation, nutrition, genetics and breeding, and vermin control.
- During their regular site visits, veterinarians must consider and where necessary, review management practices, policies and procedures. Any management deficiencies that need to be corrected to ensure humane animal care and use must be reported to senior administration and to the animal care committee for correction.
- Ensuring that endpoints are established and followed to preclude 'death as an endpoint' in all studies where this has not specifically been approved by the animal care committee;
- Establishing a receiving, quarantine and acclimation program to adapt animals to

new environments and husbandry procedures. These programs help to prepare the animals for health checks and clinical examinations as well as for either short-term or long-term restraint procedures or confinement.

- Establishing and overseeing record keeping, identification and other medical and use records.
- Improving and enriching an animal's environment to minimize the development of physiological or behavioural abnormalities or anomalies.
- Performing periodic clinical evaluations for each of the species maintained and the experimental situation.
- Maintaining vigilance over experimental or other conditions which may lead to pain and suffering for the animals and report to senior administration and the animal care committee where such pain and suffering can and should be eliminated or reduced if unavoidable. Particular close veterinary attention needs to be paid to certain procedures for antibody production, burn studies, endurance tests, swimming mazes, isolation, light deprivation, certain laboratory/physiology teaching protocols (especially live animal demonstrations) and certain field studies such as predator/prey contacts.
- Maintaining vigilance over experimental or other conditions to monitor for compliance with approved protocols. Should deviations occur, the veterinarian should address this with the researcher, the animal care committee and senior administration.
- Providing counsel on humane aspects and ethics of proposed uses of animals in research, teaching, and testing to animal users, ACC members, students, animal care staff, senior administration, and others with a vested interest.

## **2) Use of Animals in Research, Teaching and Testing**

The veterinarian must be involved in the review of all protocols and projects in the institutional animal program. This includes advising investigators on the design and performance of experiments using animals, model selection, data collection and analysis, and methods and techniques proposed or in use, including the selection and application of endpoints, surgical manipulations, selection of anesthetics and analgesics, physiological and behavioural manipulations, and euthanasia. While it may be beyond the professional competency of any single veterinarian (or person) to judge in all situations whether a particular hypothesis can best be tested in an *in vitro* model or in an intact living animal, the veterinarian must be provided with an opportunity for input into this decision making process. This responsibility is usually shared with investigators, peer reviewers, and the institutional animal care committee. The veterinarian's role in the use of animals in research, teaching, and testing also includes advice on alternatives and/or refinements to

the use of animals and providing such information to senior administration and the institutional animal care committee. This is done in collaboration with other members of the animal care committee, investigators, colleagues and peers.

### **3) Disease Detection and Surveillance, Prevention, Diagnosis, Treatment and Resolution**

- This includes provision of programs for reception, isolation and stabilization/acclimation of newly arrived animals. These steps are necessary to provide time to assess the health status of incoming animals and permit them not only to recover from the stress of shipping but also adapt to their new environment. This also acts as a safeguard for the protection of animals already in-house. The extent of these programs depends on several factors, such as the species and source of the animals, as well as their intended use and accommodation.
- For some animals, such as rodents obtained from reliable sources for which health and previous history are known, visual inspection on arrival may suffice. For other animals, appropriate quarantine and isolation procedures must be employed. In addition, during this quarantine and isolation period, preventive medicine programs such as vaccinations, ecto- and endoparasite treatments and other disease control measures should be initiated according to current veterinary medical practices appropriate to the particular species and source. All animals must be obtained legally from reputable suppliers, and every effort should be made through written agreements with suppliers to ensure that only healthy animals are acquired for research, teaching, or testing purposes. Abnormal conditions such as deformities or diseases are only acceptable in research animals if these have been justified and approved by the institutional animal care committee.. Animals should not routinely be accepted from commercial pet stores or "back-yard" breeders unless reasons have been justified to the animal care committee and prior approval has been obtained.
- The CALAM/ACMAL Standard of Veterinary Care requires daily observation of all animals by a person(s) qualified to assess their well-being. Depending on the size of the facility and in those units with part-time or consulting veterinarians, it may not be practical or possible for a veterinarian to make this assessment personally each day. However, at a minimum, a trained animal technician must see each animal each day. There must be a timely and accurate method for communication of any abnormalities or concern regarding animal health, behaviour, and well-being to the veterinarian or delegate, preferably through established written standard operating procedures. The institution must support the veterinarian in providing prompt treatment to ill or injured animals and in investigating any unexpected deaths.
- Diagnostic laboratory services must be available and used as determined by the veterinarian. Disease surveillance is a major responsibility of the institutional veterinarian. This surveillance should include monitoring for pathogens that may

infect living animals. The extent of this aspect of providing veterinary care will depend upon the species, source, use and number of animals housed and used in the facility. Rodents housed in institutions for periods of six months or more should be monitored for the presence of pathogens through the use of sentinel animals. Laboratory and diagnostic services should include necropsy, histopathology, microbiology, clinical pathology and parasitology as well as other routine or specialized laboratory procedures (such as radiology) as needed. This is particularly critical when transgenic rodents are being used. It is not essential for these services to be available within the animal facility, if other laboratories in the institution or outside resources can be used.

- When infectious hazards are recognized, the animals involved must be isolated from others by placing them in isolation units or separate rooms appropriate for the containment of the agents of concern according to the Health Canada Laboratory Biosafety Guidelines and other relevant guidelines. In certain circumstances, when an entire group of animals is known or suspected to be exposed or infected, it may be necessary to keep the group intact during the time required for diagnosis and treatment, for taking other control measures, or for completion of a project.
- Following diagnosis of an animal disease, the veterinarian must have the authority to use appropriate treatment, control measures and/or euthanasia. The veterinarian should make every effort to discuss the problem with the principal investigator or project director to determine the most appropriate course of action. However, if the animal users cannot be reached in the case of a pressing health problem, or if agreement cannot be reached concerning treatment, the veterinarian must have authority to euthanize any animal found to be suffering and where deemed necessary, institute measures to protect the health and well-being of other animals.
- Such authority should be delegated to the veterinarian(s) by the institutional animal care committee and the relevant institutional authority, and the veterinarian(s) should work with the animal care committee and report back to this body with respect to any threat to, and actions taken to protect animal health and well-being. Veterinarians must work actively with animal users, the animal care committee and the animal care staff to determine the definition and monitoring schedule for application of endpoints for all animal studies, and in particular for invasive studies. These definitions and schedules for endpoints should be described by the institution's SOPs and in approved Animal Use Protocols.
- Arrangements should be reached before a protocol begins with regard to the disposition of the animals and of their tissues, particularly in the event of an expected death that occurs while a researcher is unavailable. Veterinarians must be informed of any unexpected deaths, ensure that written records of deaths and animals euthanized are kept, and must participate in identifying the cause of any deaths.

#### **4) Handling and Restraint: Anaesthetics, Analgesics, Tranquilizer Drugs and Methods of Euthanasia**

The CALAM/ACMAL Standards of Veterinary Care include provision of guidance and monitoring of animal handling and restraint, and the use of anesthetics, analgesics, tranquilizers and euthanasia. According to current veterinary practices and legislation, veterinarians must have the authority to ensure that:

- a) all controlled substances are prescribed according to the species to be used and the intended purpose of the agent;
- b) controlled substances are administered by trained and qualified staff, and that any necessary follow-ups are conducted;
- c) detailed, written records are kept of controlled substance use;
- d) controlled substances are safely stored in double-locked, opaque, secure facilities;
- e) controlled substances are not used after their expiry dates and are disposed of safely at their expiry dates.

All those involved in animal care and use must respect federal and provincial laws and regulations on human and veterinary drugs and treatments. Where investigators hold their own drug licence(s), it is their responsibility to adhere to such regulations and legislation. Veterinarians need to be aware of drug usage in the animal facility under others' licences and become involved if problems arise with pain management, anesthesia maintenance, or inappropriate usage of drugs.

Written guidelines/SOPs regarding the selection and proper use of anesthetics, analgesics and tranquilizing drugs and euthanasia practices for all species used should be available. Written guidelines may be developed in-house or specific references provided to the current veterinary literature. In addition, the veterinarian or trained animal technician under veterinary supervision should provide advice or instruction in the proper use of such agents and euthanasia procedures. Such practices must be periodically reviewed and as standards and guidelines become more refined and/or regulated, these changes must be reflected in the institution's SOPs.

The responsible and legal use of restraint and handling procedures, pharmacological agents and euthanasia practices is an integral part of the CALAM/ACMAL Standards of Veterinary Care and must be addressed in the institutional review of research proposals and programs. In the selection of the pharmacologic agent(s) or euthanasia practices, the veterinarian must exercise good professional judgment in keeping with the goals of the specific project, and in collaboration with its principal investigator while abiding by legislation, guidelines, and the institution's SOPs.

The veterinarian must have the responsibility and authority to assure that treatment, anesthesia, analgesia, or euthanasia is administered as according to current veterinary standards to relieve unnecessary pain or suffering of any form. Such intervention must be compatible with the intended outcome of the research protocol and approval granted by the animal care committee if contraindicated.

### **5) Surgical and Post-Surgical Care**

The CALAM/ACMAL Standards of Veterinary Care includes the responsibility for review and approval of all pre-operative, surgical and post-operative procedures. The veterinarian must have the responsibility and authority to ensure that facilities intended to be used for surgical procedures meet current requirements as determined by the institutional animal care committee, legislation, guidelines, and the institution's SOPs and that personnel are trained and competent in the use and operation of such facilities. The veterinarian is responsible for monitoring, reviewing, and providing recommendations for pre-operative procedures, surgical techniques, anesthesia selection, administration and surveillance, and qualifications of personnel to perform aseptic survival surgery, provide post-operative care and maintain appropriate records.

While the criteria for physical facilities for non-recovery surgery are not as stringent as those for aseptic recovery surgery, the standards for handling, restraint, anesthesia and analgesia and the recovery of sterile samples remain constant to ensure viable research results. In the case of non-recovery surgery, the method of euthanasia must meet current standards for the species.

### **6) Related Concerns**

Other areas of professional concern and responsibility in which veterinary involvement is strongly recommended include:

- a) participating in the development, delivery and administration of training for institutional animal care and use personnel, including scientists, students and technicians, in the care and use of experimental animals.
- b) assisting institutional health officials to monitor occupational health matters for all animal care workers and others who may have contact with animals, as well as to protect those within the institution more generally. This includes issues surrounding biohazardous agents, chemical hazards, zoonoses, animal allergy, radioactive materials, and workplace ergonomics.
- c) monitoring for and taking preventative measures against zoonotic diseases separate from animal disease surveillance (eg, leptospirosis, rabies, *Coxiella burnetti* infection and Herpes B virus).
- d) advising on and monitoring of standards of hygiene among institutional staff involved with animal care and use.

- e) advising on and monitoring of biologic and chemical hazard control policies and procedures as they apply to animal care and use including the handling of waste, bedding, agents, samples, and cadavers.
- f) ensuring adherence to institutional policies and legislation covering the use and disposal of radioactive materials, waste (including animal waste, bedding and samples), and cadavers when used in animal research or testing.
- g) ensuring that in those instances where animals are removed from the animal facility for research or teaching that these same standards are met and monitored, and that prior approval for such use outside the animal facility has been authorized by the animal care committee and the departments where the animals are to be used. Veterinarians should be consulted in those instances where involvement of housekeeping, infection control and/or the occupational health and safety office may be required.

- **Statement of Principle**

The members of CALAM/ACMAL believe that both the Association and its individual members have a responsibility to provide leadership in the development of humane methods of animal use in research, teaching and testing done with due consideration of the three Rs; reduction of the number of animals used, replacement of the animals where possible, and refinement of techniques and procedures employed (Russell & Burch, 1959). CALAM/ACMAL supports the principle that elimination of pain and distress (refinement) should be given more weight than reduction in the number of animals used when applying the three Rs. The Association has issued this detailed statement to define, in both general and specific terms, what it believes to constitute the essential components of standards of veterinary care for laboratory animals in Canada.

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