



CALAM Standards of Veterinary Care

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- **Introduction**

These standards have been developed by the Canadian Association for Laboratory Animal Medicine (CALAM) to establish standards of veterinary care for laboratory animals* used in research, teaching, testing, and production in Canada. They should assist institutions across the country in formulating and evaluating specific programs of veterinary care for laboratory animals and for developing job profiles. In addition to serving as an educational tool for institutions, these standards will help increase public awareness of the roles, responsibilities and functions of a laboratory animal veterinarian.

The professional judgement of a veterinarian trained and/or experienced in laboratory animal medicine is essential in the application of these standards. 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, policies and legislation include the Veterinarian's Act, provincial legislation, the Tri-Council Memorandum of Understanding with institutions, and the Canadian Council on Animal Care (CCAC) guidelines and policy statements. CALAM Standards of Veterinary Care are: 1) in accordance with federal and 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 professional conduct of veterinarians; and, 3) are supported by the CCAC. CALAM recognizes that institutions may have additional internal policies and procedures that may direct the veterinarian in the execution of their duties and responsibilities. The CCAC uses the CALAM Standards of Veterinary Care document as a basis for the assessment of the veterinary and animal health and welfare components of animal care and use programs in institutions using animals for scientific purposes.

*laboratory animal refers to any animal species maintained for the purposes of research, teaching, testing or production of animals or biologics for scientific purposes, and generally applies to vertebrates and some cephalopods.

- **CALAM Status**

The Canadian Association for Laboratory Animal Medicine (CALAM) is an association representing veterinarians in Canada working in the specialty of laboratory animal medicine, and is a veterinary specialty group of the Canadian Veterinary Medical Association (CVMA).

- **CALAM Position on Veterinary Licensure, Training and Continuing Education**

The institutional veterinarian(s) should be licensed member(s) in good standing of a provincial veterinary governing body in Canada and qualified by virtue of training or experience in laboratory animal science and medicine to perform in that capacity. Fulfilling all the responsibilities for veterinary care of experimental animals outlined in this document will require a license to practice veterinary medicine in that jurisdiction.

Laboratory animal science and medicine are rapidly changing and evolving areas of science. Opportunities and support for annual professional development and continuing education must be provided by the institution. To accomplish this, the institution must support, either directly or through remuneration offered to consulting veterinarians, membership(s) in relevant organizations, and regular continuing education and training opportunities in experimental animal care and use for the veterinarian(s), such as:

- membership in, and participation in, CALAM and Canadian Association for Laboratory Animal Science (CALAS) activities; and,
- attendance at laboratory animal science courses and meetings (e.g., Canadian Distance Certificate in Laboratory Animal Medicine, Canadian Aquaculture Institute courses, Charles River Short Course, Jackson Laboratory courses, American Association for Laboratory Animal Science (AALAS) symposia, CCAC workshops, etc.); and,
- access to laboratory animal science journals.

The CCAC requires that veterinarians have continuing education and training in their field.

- **CALAM 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 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 activities that involve animal use. The structure of the veterinary program, including the number of licensed veterinarians and their background and training must be appropriate to fulfill the program's requirements and to ensure that the CALAM Standards of Veterinary Care are met. This will vary by institution.

In all cases, formal arrangements must be made by the senior administration of the institution to ensure that veterinary services are readily available at all times to meet both routine and emergency needs. Animal caregivers and users must be able to report an animal health or welfare concern (e.g., injury, ill health, or death) at any time, and a veterinarian must be available to respond to the concern.

The responsibilities of the veterinarian(s) include:

- active participation by at least one veterinarian on the animal care committee(s);
- serving as an expert advisor and animal advocate to the animal care committee(s) on strategies to address the three Rs – reduction, refinement and replacement – and on matters of animal welfare, housing, care and use. In particular, this includes anesthesia and analgesia, creation and suitability of animal models, establishment of endpoints, zoonoses, biohazards, and occupational health and safety as it relates to the housing and use of animals.

- regular visits to 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 caregivers 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, acclimate, and introduce various species into the animal facilities;
- development of appropriate endpoints for all animal studies, and in particular for invasive studies, working with the principal investigator and the animal care committee. The definitions and schedules for endpoints should be described in the institution's Standard Operating Procedures (SOPs) and in approved animal use protocols;
- participation in the development, implementation and review of Standard Operating Procedures (SOPs) for animal care, animal use, facility management, 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 and communications with the animal care committee, senior administration, investigators and animal care staff, to ensure best practices in the care and use of experimental animals;
- provision of advice to animal users and animal caregivers, in particular on anesthesia and analgesia regimens, antibiotics, and other therapeutic agents. Animal users must have direct access to veterinary advice when preparing animal use protocols, and be able to discuss any animal related issues, such as animal welfare, experimental design, endpoints, regulatory or health concerns;
- provision of advice on the design and equipping of all new construction or renovations of any facility space or area where animals are or will be housed or procedures performed;
- participation in the development of programs and the delivery of education and training of animal users and animal care givers.

- **The Veterinarian's Institutional Standing, Authority, and Relationships**

The veterinarian should report directly to the senior administrator responsible for animal care and use in the institution (e.g., Vice President 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. Clinical laboratory animal veterinarians may report to their directors, or to the Vice President Research through their directors.

Where there are multiple institutions, faculties, departments or other such divisions, the authority of the veterinarian across all of these must be formally recognized by the head of each of these divisions.

The institution and its animal care committee(s) must acknowledge, and define in writing, the responsibilities and authority of the veterinarian(s). The veterinarian should work with the animal care committee and the senior administrator to identify and address concerns related to animal care and use. The veterinarian must be familiar with the various uses of animals in the institutional research, teaching, testing or production 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, projects, and institutional programs involving animals used in research, teaching, testing or production. The veterinarian must have access to all animal use protocols and records related to them. There is a continuing institutional responsibility to foster and support improvement of the program through identification and adoption of techniques, procedures and policies that will ultimately lead to enhanced animal health and well-being. Healthy, well cared for animals are a prerequisite for good quality animal-based science.

The veterinarian(s) must be responsible for and have authority, delegated by the senior institutional administrator and the animal care committee, to assure the provision of a comprehensive veterinary care program and to oversee all aspects of animal care and use.

The senior administration of the institution(s) and the animal care committee must delegate to the veterinarian(s) the authority to treat, remove from a study, or euthanize if necessary an animal based on the professional judgement of the veterinarian.

A veterinarian must provide advice to each committee within the institution where animal care and use is discussed or determined. This includes animal welfare and veterinary care, occupational health and safety, biosafety, crisis management, animal facility oversight and planning, animal-based research facility oversight and planning, etc. Ideally this is best achieved through a direct presence on the relevant committee.

The veterinarian should be consulted in advance when new scientists are recruited or programs are being developed that involve animal use, to ensure that the appropriate space, facilities and equipment are available to meet the needs of the scientist and the animal model. The veterinarian will advise the administration of any deficiencies or shortcomings to be addressed in order to accommodate the work.

- **Primary Areas of Veterinary Responsibilities**

- **Animal Welfare**

The well-being and welfare of the animals used in research, teaching, testing or production are the main focus for all the laboratory animal veterinarian's roles and responsibilities. This includes responsibility for promoting and monitoring of an animal's welfare before, during and after its use. 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 provision of 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 ensure that all projects receive institutional review and approval. 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. In terms of veterinary care, each animal is to be treated with the same ethical consideration, the same high standards of veterinary care, and must have equal access to appropriate conditions that meet its physical, physiological and behavioural needs.

CALAM Standards of Veterinary Care involve six general areas of responsibilities:

1. Animal Care

The following are important components of the animal care aspects of the veterinary program:

- Sourcing and procuring animals. The veterinarian should establish good working relationships with reputable suppliers to 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, particularly from non-commercial sources, prior to giving consent for shipment of the animals to the institution. The veterinarian is an important educational resource for animal users, the animal care committee, and animal care personnel on issues associated with animal suppliers and sources including matters of public perception and related concerns.
- Establishing a receiving and quarantine program to protect the biosecurity of the institution and the animals already maintained.
- Establishing an acclimation program to adapt animals to new environments, caregivers and husbandry procedures. Acclimation programs help prepare the animals for health checks and clinical examinations as well as for either short-term or long-term restraint procedures or confinement.
- Provision of a physical plant, caging and ancillary equipment. The veterinarian 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 regarding caging (traditional, nontraditional and

specialized) and other housing, containment (e.g., barriers) and confinement matters pertaining to basic maintenance and experimental conditions. During their regular site visits, the veterinarian must remain alert to any physical infrastructure deficiencies that must 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 the animal care committee and senior administration 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 are met through the supply of quality feed, bedding, and other sundries necessary for the well being of the species. The veterinary staff must 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. The veterinarian 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 institutional 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, the veterinarian 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 the animal care committee and senior administration for correction.
- 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.
- Disposition of the animals. The veterinarian should be involved in decisions regarding disposition of the animals, e.g., adoption programs, carcass disposal, food animals re-entering the food chain.

2. Use of Animals in Research, Teaching, Testing and Production

The veterinarian must be involved in the review of all protocols and projects in the institutional animal program. This includes advising 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 to judge in all situations

how 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 shared with the 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 provision of information on refinements to the use of animals. This is done in collaboration with other members of the animal care committee, investigators, colleagues and peers.

The following points are important components of the veterinary program:

- Maintaining vigilance over experimental or other conditions that may lead to pain and suffering for the animals and reporting to the animal care committee and senior administration as necessary, where such pain and suffering can and should be eliminated or reduced. Particularly close veterinary attention needs to be given to procedures with a greater potential for resulting in animal distress or pain.
- 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.
- Maintaining vigilance over experimental or other conditions to monitor for compliance with approved protocols. Where deviations occur, the veterinarian should address this with the researcher, the animal care committee and senior administration as appropriate.
- 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 as needed, and participating in animal care and use, and ethics courses.

3. Health Management, and Disease Detection and Surveillance

- All animals must be obtained legally from reputable suppliers, and every effort should be made through written agreements with vendors to ensure that only healthy animals, normally with a defined background, are acquired for research, teaching, or testing purposes. Where there is uncertainty about the standard of animal care provided by a supplier, the veterinarian shall make efforts (e.g., consult with colleagues, site visits) to obtain sufficient information to make an informed decision as to the standard of care provided to the animals. Special attention must be paid to animals obtained from pound sources to ensure that each animal is examined for any and all forms of identification, in addition to thorough health evaluation.
- Abnormal conditions such as deformities or diseases are only acceptable in research animals if these have been justified and approved by the animal care committee. Animals should not routinely be accepted from commercial pet stores or 'backyard' breeders unless strong justification has been provided to the animal care committee and prior approval has been obtained. Records should be kept of all animal procurements.

- Programs for reception, isolation and acclimation of newly arrived animals must be provided. These steps are necessary to provide time to assess the health status of incoming animals and permit them to recover from the stress of shipping and 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 practices appropriate to the particular species and source.
- Health monitoring programs also include veterinary herd/flock health programs for livestock, and health monitoring for aquatic species.
- All animals must be observed daily 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. At a minimum, a trained animal technician or stockperson 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.
- Monitoring of all genetically modified animals for phenotype is important, and particularly for newly created models. Phenotypes that may affect the health or well-being of the animals, or that might have an impact on the requirements for care, should be identified.
- Diagnostic laboratory services must be available and used as determined by the veterinarian. Disease surveillance is a major responsibility of the institutional veterinarian. A disease/health surveillance program suitable for the species, type of housing and nature of work must be developed and overseen by the veterinarian. The extent of the surveillance program will depend upon the species, source, use and number of animals housed and used within the facility. Rodents housed in institutions for periods of six months or longer 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 genetically modified rodents are being used. It is not essential for these services to be available on-site, if other laboratories within the institution or outside resources can be used.

- The veterinarian should coordinate the response to disease outbreaks. When infectious hazards are recognized, appropriate measures must be instituted to minimize risk to other animals. 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. If the animal user(s) 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, working with the animal care committee.
- 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 occurring when a researcher is unavailable. The veterinarian 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, Sedation, Anesthesia and Analgesia, Methods of Euthanasia

The animal care committee, working with the veterinarian, must ensure that all personnel working with animals are identified on the protocol and have received training appropriate for the animal handling and other procedures they will be performing. The veterinarian must have the authority to prohibit individuals who are not on a protocol or who are not appropriately trained, from working with animals until the matter is addressed.

The veterinarian must provide guidance and monitor animal handling and restraint, the use of anesthetics, analgesics, tranquilizers, and euthanasia. The veterinarian should be involved in the regular review of all anesthetic and analgesic protocols.

According to current veterinary practices and legislation, the veterinarian must have the authority to ensure that:

- prescription drugs and controlled substances are administered according to the species to be used and the intended purpose of the agent;
- controlled substances are administered by trained and qualified staff, and that any necessary follow-ups are conducted;
- detailed, written records are kept of controlled substance use, and any drugs remaining are appropriately disposed of at the end of a study;

- controlled substances are safely stored in double-locked, opaque, secure facilities;
- prescription drugs and controlled substances are not used after their expiry dates and are disposed of legally and safely at their expiry dates.

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

Written guidelines/SOPs regarding the selection and proper use of anaesthetics, 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 their supervised delegate should provide advice or instruction in the proper use of such agents and euthanasia procedures. Such practices should be periodically reviewed and as standards and guidelines are refined, the changes must be reflected in the institutional SOPs.

The responsible and legal use of restraint and handling procedures, drugs, and euthanasia practices is an integral part of the veterinarian's responsibilities 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 the 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 according to current veterinary standards to relieve unnecessary pain or suffering. The intervention should be compatible with the intended outcome of the research protocol, if possible, and approval granted by the animal care committee if incompatible.

5. Surgical and Perioperative Care

The veterinarian has responsibility for review and approval of all preoperative, surgical and postoperative procedures. The veterinarian must have the responsibility and authority to ensure that facilities intended for surgical procedures meet current veterinary standards as determined by provincial legislation 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 preoperative procedures, surgical techniques, anesthesia and analgesia selection, administration and surveillance, and qualifications of personnel to perform aseptic survival surgery, provide postoperative care and maintain appropriate records.

While the criteria for physical facilities for nonrecovery surgical procedures 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 CCAC-recognized standards for the species.

6. Other Responsibilities

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

- participating in the development, delivery and administration of training in the care and use of experimental animals for institutional animal care and use personnel, including scientists, students and technicians, and animal care committee members;
- participating in institutional occupational health matters for all animal care workers and all those who may have contact with animals. This includes issues surrounding biohazardous agents, chemical hazards, zoonoses, animal allergens, radioactive materials, and workplace ergonomics;
- monitoring for and taking preventative measures against zoonotic diseases separate from animal disease surveillance, (e.g., rabies virus, *Coxiella burnetii*, and Cercopithecine herpesvirus 1 - herpes B virus);
- advising on and monitoring of standards of hygiene among institutional staff involved with animal care and use;
- 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;
- 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;
- participating in developing institutional responses to concerns and criticisms related to the use of animals in science;
- participating in the development of institutional crisis management plans related to animals and animal facilities;
- ensuring that in those instances where animals are removed from the animal facility for research or teaching that these same standards are applied, 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. The veterinarian should be consulted in those instances where involvement of housekeeping, infection control and/or the occupational health and safety office may be required.

- participating in the development of institutional management and administrative structures to ensure seamless and efficient animal care and use program delivery;
- participating in the management of institutional animal care and use programs extending to responsibilities for oversight of all elements of the animal care and use program.

- **Statement of Principle**

The members of CALAM believe that both the Association and its individual members have a responsibility to provide leadership in the development of best practices for the humane care and use of animals in research, teaching, testing and production, with due consideration of the three Rs: replacement of the animals where possible; reduction of the number of animals used; and; refinement of techniques and procedures employed (Russell & Burch, 1959). CALAM 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 these standards 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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