BROWN

Institutional Animal Care and Use Committee (IACUC)
Directive 11.0: Physical Restraint of Laboratory Animals

1.0 Directive Purpose

The purpose of this directive is to outline the minimally acceptable standards for physical restraint of laboratory animal species for experimental purposes.

2.0 To Whom the Directive Applies

This directive applies to all individuals involved in research using live vertebrate animals, covered under an IACUC-approved animal use protocol at Brown University.

3.0 Directive Statement

The Brown University Institutional Animal Care and Use Committee (Brown IACUC) acknowledges that physical restraint of an awake, un-anesthetized animal may be necessary due to the scientific goals of certain studies, and follows *the recommendations set forth in the Guide for the Care and Use of Laboratory Animals* (2011) ("the *Guide*") in reviewing and approving any animal use protocol involving Physical Restraint. It is sometimes necessary to restrain animals for husbandry and research purposes, both to accomplish treatment or scientific objectives and to ensure the safety of the animal and human handler. Prolonged restraint can be stressful and has the potential to cause harm to the restrained animal under certain circumstances; therefore, it is critical that all individuals to whom this policy applies employ considerable care when using any type of Physical Restraint, and particularly Prolonged Restraint. Prolonged Restraint should be used only when other means are not feasible and only following determination by the IACUC that the study objectives justify the procedures. Convenience alone will not normally be deemed sufficient justification for Prolonged Restraint.

3.1 Animal Use Protocol Requirements

When Prolonged Restraint is proposed in an animal use protocol, the protocol must include a description of the restraint device, the duration the animal will be restrained, and a description of how the animal will be acclimated, trained prior to the procedure, and observed. It must also include what signs and/or behaviors will indicate that the animal should be removed from the restraint and/or study. If the duration of the Prolonged Restraint limits the ability of the animals to access food and water for ≥ six hours the protocol must also include a description of when food and water will be given and how body weight and hydration status will be monitored.

3.1.1 Restraint that does NOT require justification in an animal use protocol

If routine manual restraint will not be prolonged and will not cause distress or discomfort to the animal, a description is not required in the animal use protocol. Any use of a mechanical restraining device requires a description in the animal use protocol.

The following types of restraint *do not require justification* or a description in the animal use protocol:

- Brief (<15 minutes) Physical Restraint that is part of normal animal-handling practices (*e.g.*, moving mice from one cage to another).
- Brief (<15 minutes) manual restraint for procedures such as substance administration or sample collection (*e.g.*, restraint of an animal to administer an intraperitoneal [IP] injection).

The following types of restraint do not require justification *but do require a description* in the animal use protocol:

- Brief (<15 minutes) mechanical restraint of animals by personnel trained in the use of the device (*e.g.,* restraint of a sheep in a squeeze chute by trained personnel to give a vaccination).

3.2 Prolonged Restraint

Brown University defines Prolonged Restraint as restraint over 15 minutes. Brown considers such Prolonged Restraint in an animal use protocol to be a quantifiable departure from the *Guide* and will therefore include information about the Prolonged Restraint in its semi-annual reporting to the Institutional Official. Prolonged Restraint, including chairing of non-human primates, must be avoided unless it is essential for achieving research objectives and is specifically approved by the IACUC.

Certain types of housing conditions for large agricultural animals may involve limiting free movement over long periods of time. Brown follows the *Guide for the Care and Use of Agricultural Animals in Agricultural Research and Teaching* (2011), which addresses the use of confining devices, such as stanchions and squeeze chutes, and emphasizes several important guidelines, which Brown adopts as its policy: 1) confining devices must be approved by the IACUC when used for experimental purposes; 2) animals that will be confined must be well-acclimated and monitored; and 3) continuous confinement must be limited if not needed and cannot be considered normal housing.

3.3 Training

Any person using restraint procedures, even if for brief periods of time, must receive formal training and demonstrate proficiency to someone who has already been trained prior to carrying out these techniques unsupervised. Training must include practice putting an animal into the relevant restraint device, as well as removing it safely.

3.4 Monitoring

If the restrained animal can potentially hurt itself while restrained, or if restraint is employed to prevent possible interference with catheters or other instrumentation that could be dangerous to the animal, then monitoring of the animal must be continuous. Notations documenting this monitoring must be recorded each hour of the restraint period, at a minimum. In general, continuous monitoring is required if the period of restraint exceeds four hours. For shorter periods, between one and four hours, monitoring at periodic intervals is necessary to ensure the wellbeing of the animal. Indirect monitoring by camera may be utilized if the observer can respond to an emergency in a timely manner. A description of the monitoring procedures, including a statement about the frequency and duration of monitoring, must be included in the animal use protocol and approved by the IACUC.

3.5 Sustained Restraint

Restraint for periods longer than 12 hours, especially overnight, requires special justification and can be conducted only when the scientific goals or treatment exigencies do not allow for other options. In general, animals must be released for at least one hour after every 12-hour restraint period, unless the IACUC and Attending Veterinarian (AV) concur that it would be ill-advised for safety reasons (*e.g.*, in the case where the catheter or instrumentation cannot be easily removed and safely reinstalled). Continuous monitoring of animals subject to restraint for periods longer than 12 hours is required and close oversight of the project must be maintained by the IACUC and AV.

3.6 Complications

Regardless of the length and frequency of restraint, complications may arise from restraint procedures. These problems could initially seem relatively minor, such as small abrasions or edema, but persons handling animals must take care to preclude the possibility of exacerbation or infection. Food and water intake between periods of Prolonged Restraint must be monitored, and body weight records must be maintained, especially in young or growing animals. The AV or the AV's designee has the authority to terminate the restraint procedures at any point should there be signs of complications compromising the animal's wellbeing. Records of any complications must be maintained and be made available to the IACUC upon request. The Principal Investigator must notify the AV to evaluate any clinical concerns. Should the AV determine that treatment for the animal is necessary, such treatment will take precedence over experimental objectives.

3.7 Additional Considerations

The Principal Investigator must account for the following additional considerations in any animal use protocol involving restraint procedures:

- Alternatives to Physical Restraint. Systems that do not limit an animal's ability to make normal postural adjustments (e.g., subcutaneous implantation of osmotic pumps in rodents, backpack-fitted infusion pumps in nonhuman primates, and free-stall housing for farm animals) must be used when compatible with protocol objectives.

- The period of restraint must be the minimum required to accomplish the research objectives.

- Animals to be placed in restraint devices must be given training to adapt to the equipment and to personnel. Nonhuman primates and many other animals can be trained through the use of positive reinforcement techniques, to cooperate with research procedures or remain immobile for brief periods. Animals that fail to adapt to training should be removed from the study in consultation with a veterinarian.

- Brief Physical Restraint of agricultural animals for examination, collection of samples, and a variety of other experimental and clinical manipulations can be accomplished manually or with devices such as stocks, head gates, stanchions, or squeeze chutes.

- If mechanical restraint devices are employed, the restraint devices must be appropriate for the species, employ designs of known safety, and be in good working order. The device must be appropriate for the stated objectives (*e.g.,* to minimize self-inflicted harm if utilized to prevent an animal from grabbing catheters or instrumentation).

4.0 Definitions:

For the purpose of this directive, the terms below have the following definitions**:**

Physical Restraint: Physical Restraint is the use of manual or mechanical means to limit some or all of an animal's normal movement for the purpose of examination, collection of samples, drug administration, therapy or experimental manipulations. Animals are restrained for brief periods, usually minutes, in many research applications (the *Guide*, p. 29).

Restraint is assumed to involve immobilization and some limitation of normal postural adjustments. Personnel safety may also necessitate restraint of an animal.

Prolonged Restraint: Although the criteria for prolonged restraint vary according to species and type of restraint, it is generally considered to involve periods of restrains of a conscious animal lasting longer than 15 minutes.

5.0 Responsibilities

All individuals to whom this directive applies are responsible for becoming familiar with it and following this. Animal research program stakeholders (IACUC, CARE, ARC) are responsible for promoting the understanding of this document and for taking appropriate steps to help ensure adherence to it.

6.0 Consequences for Violating this Document

Violation of this document may be considered a serious event of noncompliance that is reportable to the IACUC, funding and accrediting agencies, as well as other regulatory agencies. Violations of this document are a serious matter that may adversely affect both the ability to perform animal work and acquire funding sources.

7.0 Related Information

Brown University is a community in which employees are encouraged to share workplace concerns with University leadership. Additionally, Brown's Anonymous Reporting Hotline allows anonymous and confidential reporting on matters of concern online or by phone (877-318-9184).

The following information complements and supplements this document. The information is intended to help explain this document and is not an all-inclusive list of policies, procedures, laws and requirements.

7.1 Related Policies/Directives/SOPs: N/A
7.2 Related Procedures: N/A
7.3 Related Forms: N/A
7.4 Frequently Asked Questions (FAQs): N/A
7.5 Other Related Information: References:

- Animal Welfare Act. United States Department of Agriculture Animal and Plant Health Inspection Service. May 2020. USDA-APHIS
- Guide for the Care and Use of Agricultural Animals in Research and Teaching; 4th ed., American Dairy Science Association, the American Society of Animal Science, and the Poultry Science Association, Champaign, IL. 2020
- Guide for the Care and Use of Laboratory Animals - 8th edition, NRC. 2011.

8.0 Document Owner and Contact

8.1 Owner: IACUC
8.2 Approved by: IACUC
8.3 Subject Matter Contact: Brown University Animal Research Compliance (ARC)

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9.0 Document History

9.1 Effective Date: February 3, 2017
9.2 Last Reviewed: February 3, 2023
9.3 Update/Review Summary: This document is not new; it was pulled out of the University Compliance SOP format and converted to a Directive – February 3, 2023.

- Converted into University Compliance SOP format and re-reviewed and approved by the committee June 4, 2021.
- Revised June 1, 2018