



University of Maryland College Park Animal Care and Use Standard

Prolonged Physical Restraint

Purpose: This standard defines and provides minimum guidelines for the use of prolonged physical restraint.

Background: Animals are often briefly restrained (minutes) for many research applications. *Prolonged* restraint may have deleterious effects on the health and well-being of a laboratory animal. Additionally, the physiological reactions to restraint and potential physical impairment caused by prolonged restraint may skew the results of scientific experiments. Therefore, and in accordance with the *Guide for the Care and Use of Laboratory Animals* (National Research Council, 2011), prolonged restraint "...should be avoided unless it is essential for achieving research objectives and is specifically approved by the IACUC."

Definitions:

Physical restraint: 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 manipulation.

Prolonged physical restraint: any physical restraint greater in duration than 1 hour for ungulates, and 15 minutes for all other species except for fish, for whom prolonged restraint varies considerably, depending on species, and should be evaluated on a case by case basis. Restraint for fish may be more effectively performed under anesthesia.

Approved restraint devices: those restraint devices recognized by the IACUC as humane restraints and approved in an animal care and use protocol. Approved restraint devices should be suitable in size, design, and operation to minimize discomfort, pain, distress, and the potential for injury to animals and staff.

Standards: Prolonged restraint should be avoided when possible. When necessary to achieve research objectives, researchers should use the least restrictive means of restraint and minimum period of time in restraint that still accomplishes the research objectives. Restraint devices should be specifically designed to accomplish research goals that are impossible or impractical to accomplish by other means or to prevent injury to animals or personnel. Restraint devices that do not restrict normal postural adjustments should be used when compatible with protocol objectives. Animals that do not adapt to restraint systems should be removed from the study.

Methodology: When applying restraint, the following should be considered (as applicable):

- Alternatives to physical restraint should be considered.
- Prolonged restraint for any reason must be scientifically justified by the PI and approved by the IACUC. The device to be used, training and/or habituation methods, the maximum time used, the number of times used, and the frequency of observations should be outlined in the protocol. The investigator should explore restraint options to ensure the least restrictive and distressful method or device is used. Animals should be periodically monitored for signs of pain or distress, severe behavioral change, and for the development of lesions or illness



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associated with restraint (e.g., weight loss, dependent edema, contusions, etc.). Animals showing signs of lesions or illness must receive veterinary care. The presence of clinical signs or symptoms related to restraint may necessitate temporary or permanent removal from restraint.

- Prior to being restrained for study purposes, the animals should be given positive reinforcement training and ample time to adapt to the equipment and personnel. Positive reinforcement training procedures should be described in the protocol and sessions should be adequately documented.
- Animals that fail to adapt should be removed from the study.
- The period of restraint should be the minimum required to accomplish the research objectives. Animals should not be placed in restraint devices until study preparations are complete, and they should be removed as soon as the procedure(s) requiring restraint are concluded.
- Restraint devices are not to be used for housing. Restraint devices should not be used for a prolonged period merely as a convenience in handling or managing animals (e.g., to avoid recapturing the animal between sampling times). However, if the Attending Veterinarian, in concert with the PI, deems the restraint to be less stressful to the animal than repeated capture, s/he may authorize the animal to stay in the restraint device.
- The purpose of the restraint and its duration should be clearly explained to the personnel involved with the study.
- Restraint devices should be made of sanitizable materials, be properly maintained, and labs should maintain SOPs and documentation of sanitation for each type of device used.