



SOUTHERN ILLINOIS UNIVERSITY CARBONDALE

Institutional Animal Care & Use Committee

IACUC Policy #:	300
Policy Title:	<i>Establishing Humane Endpoints</i>
Date Approved:	May 28, 2003
Date Reviewed:	January 17, 2024
Who must know:	Principal investigators, personnel, and researchers approved to perform research, teaching, and/or testing activities

Purpose:

This policy describes the requirements for developing and defining humane endpoints for all vertebrate animals and cephalopods used in research, testing and/or teaching at SIUC. This policy provides guidance, but the Principal Investigator (PI) must also work with the Attending Veterinarian (AV) and the IACUC to determine a humane endpoint that both minimizes animal pain and distress, while allowing the study to meet research, testing, and/or teaching goals. The principles of humane endpoints apply to all vertebrates and cephalopods used in research, testing and/or teaching.

SIUC researchers work on diverse IACUC-regulated taxa including cephalopods, fish, amphibians, reptiles, birds, and mammals. No common set of endpoints would be appropriate for all taxa. Furthermore, endpoints for a particular species may vary depending on the goal of the study. The principal investigator (PI) is responsible for identifying and justifying to IACUC the appropriate endpoint for their species and study. IACUC's role will be to evaluate the justification and suggest revisions where appropriate. Helpful guides are available for cephalopods (Fiorito et al., 2015), fish (Jenkins et al., 2014), amphibians and reptiles (HACC, 2004), wild birds (Fair & Jones, 2023), wild mammals (Sikes et al., 2016), and agricultural animals (Tucker et al., 2020). PIs are encouraged to consult and cite these and similar sources for justification.

Definitions:

Humane Endpoint: as defined in the Guide, “the point at which pain or distress in an experimental animal is prevented, terminated, or relieved” (p. 27).

Experimental Endpoint: when the scientific aims and objectives have reached a pre-determined endpoint.

Morbidity: a condition relating to, or typical of, disease or illness. Any animal exhibiting signs of morbidity should be reported to appropriate staff.

Moribund: a state of dying. Any animal found to be exhibiting at least one of the specified characteristics is considered to have end-stage illness and should be euthanized immediately unless an exception has been specifically justified in the IACUC-approved protocol.



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Policy:

Animal pain, distress, discomfort, and suffering must be minimized in any experiment. Conditions or procedures that cause more than momentary or slight pain or distress should be performed with appropriate sedation, analgesia, or anesthesia. Humane endpoints refer to one or more predetermined physiological or behavioral signs that define the point at which an experimental animal's pain and/or distress is terminated, minimized, or reduced by taking actions such as euthanizing the animal, terminating a painful procedure, or giving treatment to relieve pain and/or distress. Humane endpoints are criteria used to end experiments on individual animals to avoid or terminate unrelieved pain or distress. The establishment of humane endpoints prior to the start of an experiment allows the investigator to prevent unnecessary animal pain and distress, while ensuring accurate and timely data collection. The protocol application should include detailed written criteria for humane endpoints that will be used to determine when animals can be removed from the study, treated, or euthanized. Once a humane endpoint is reached, the animal should be immediately euthanized or treated as described in the approved protocol.

When animals begin to show signs of illness, principal investigators and research personnel must monitor the animals frequently (at least once daily or as described in their protocol) to ensure timely identification of animals for which previously defined endpoints have been reached. PIs should provide clear directions to their personnel concerning who can make the decision to treat or euthanize animals, including procedures to be followed if a situation arises on weekends, holidays, or in the absence of the PI. Investigators must make every effort to identify and euthanize moribund animals that have not responded to treatment. Experiments should be designed to ensure all procedures are complete before animals become moribund.

As an example, signs and symptoms of morbidity for rodents include: inactivity; labored breathing; sunken eyes; hunched posture; piloerection or matted fur; one or more unresolved skin ulcers; abnormal vocalizations; tumors that affect normal functions, that become ulcerated, or exceed 10% of normal body weight; prolonged recumbency or inability to ambulate; CNS behavioral signs such as circling or convulsions; pain which cannot be alleviated despite administration of analgesics; inability to eat, drink, urinate, or defecate normally; bilateral blindness; septicemia.

Unless a PI identifies and adequately justifies to the IACUC an alternative timeline and sequence of events leading to euthanasia after humane endpoints are identified, endpoints are triggered by any of the following conditions:

1. Treatment effects resulting in loss of 20% of body weight from baseline weight when assigned to the protocol. A growth nomogram must be used to adjust the basal weight of growing animals.
2. Organ failure or major medical conditions that are unresponsive to treatment, such as



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respiratory distress, jaundice, loss of renal function, intractable diarrhea, self-mutilation, or persistent vomiting.

3. Surgical complications that are unresponsive to immediate intervention, such as bleeding, vascular graft/circulation failure, infection, or rupture of sutures.

Use of spontaneous death as an endpoint is strongly discouraged. In some special circumstances, however, it is necessary or unavoidable, and thus will be considered by the IACUC on a case-by-case basis. Approval of death as an endpoint requires adequate scientific justification, including reasoning for why alternative endpoints and/or analgesics cannot be used. PIs who request death as an endpoint must clearly detail plans for monitoring and supportive care, including describing monitoring frequency and record-keeping practices.

The AV has the responsibility for oversight of the health and welfare of vertebrate animals and cephalopods used for research, teaching, and/or testing at SIUC. The AV has the authority to euthanize or remove an animal from a study in the interest of animal welfare at any time. The AV will make every reasonable effort to contact the PI (or other protocol personnel designated by the PI) when euthanasia or protocol removal becomes necessary. Emergent situations may require immediate action.

References and Resources:

Fair, J., Paul, E., Jones, J., & Bies, L. (2023). *Guidelines to the use of Wild Birds in research* (4th ed.). The Ornithological Council. <https://birdnet.org/info-for-ornithologists/guidelines>

Fiorito G, Affuso A, Basil J, Cole A, de Girolamo P, D'Angelo L, Dickel L, Gestal C, Grasso F, Kuba M, Mark F, Melillo D, Osorio D, Perkins K, Ponte G, Shashar N, Smith D, Smith J, Andrews PL. Guidelines for the Care and Welfare of Cephalopods in Research -A consensus based on an initiative by CephRes, FELASA and the Boyd Group. *Lab Anim.* 2015 Jul;49(2 Suppl):1-90.

Herpetological Animal Care and Use Committee of the American Society of Ichthyologists and Herpetologists. (2004). *Guidelines for the Use of Live Amphibians and Reptiles in Field and Laboratory Research.* <https://www.asih.org/resources>

Jenkins, J.A., Bart, H.L., Jr., Bowker, J.D., Bowser, P.R., MacMillan, J.R., Nickum, J.G., Rachlin, J.W., Rose, J.D., Sorensen, P.W., Warkentine, B.E. and Whitley, G.W. (2014), *Guidelines for Use of Fishes in Research—Revised and Expanded*, 2014. *Fisheries*, 39: 415-416. <https://doi.org/10.1080/03632415.2014.924408>



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National Research Council (2011). *The guide for the care and use of laboratory animals* (8th ed.). National Academies Press. <https://grants.nih.gov/grants/olaw/guide-for-the-care-and-use-of-laboratory-animals.pdf>

National Research Council (2003). *Guidelines for the care and use of mammals in neuroscience and behavioral research*. National Academies Press. https://www.ncbi.nlm.nih.gov/books/NBK43327/pdf/Bookshelf_NBK43327.pdf

Sikes, R. S. (2016). 2016 guidelines for the American Society of Mammalogies or the use of wild animals in research. *Journal of Mammalogy*, 97(3), 663–688. <https://doi.org/10.1093/jmammal/gywo78>

Tucker, C. B., MacNeil, M. D., Webster, A. B. (Eds.). (2020). *The guide for the care and use of agricultural animals in research and teaching* (4th ed.). American Society of Animal Science. <https://www.asas.org/services/ag-guide>

United States Department of Agriculture, 9 C.F.R §1. (2023). *Animal Welfare Act and Animal Welfare Regulations*. <https://www.ecfr.gov/current/title-9/chapter-I/subchapter-A>