

IACUC Guidelines on Humane Endpoints

Last Review: 4/2022

Revision History:

Humane Experimental Endpoints – criteria used to end experiments on individual animals in order to avoid or terminate unrelieved pain and/or distress. Once a humane endpoint is reached, the animal should be immediately euthanized or treated as described in the approved protocol.

The presence of one or more of the following criteria below may be indications for euthanasia. The professional judgment and decision of the Veterinarian will be final. The clinical signs, depending on severity and duration, that may constitute an endpoint include, but are not limited to: *this list is not exhaustive*

- ***Hunched posture, lethargy, persistent recumbency, or inability to rise or ambulate*** – This condition would indicate that an animal would not be able to reach for food/water. Animals should be euthanized within 24 hours of not being able to rise.
- ***Rough or unthrifty hair coat*** – healthy rodents fastidiously groom their hair coats.
- ***Dyspnea*** – labored breathing. A humane endpoint may be reached when animals show an altered respiratory rate and/or effort. Labored breathing is often accompanied by a strong abdominal component to breathing.
- ***Dehydration*** – as evaluated by skin turgor. Severe dehydration is manifested when an animal's skin loses elasticity. Skin pinched over the back that does not return to normal is called "tenting" and if this is excessive, it is considered a humane endpoint.
- ***Anorexia/Weight loss*** – A 20% weight loss over a few days would be considered rapid. This requires frequent monitoring. A gradual weight loss over an extended period of time (weeks to months), which leads to emaciation, would also be grounds for euthanasia. Degree of weight loss and monitoring frequency should be defined and described in the IACUC approved protocol.

- ***Tumor size*** – Tumor burden should not exceed 10% body weight in an adult rodent and/or 1.5cm diameter in adult mouse or 3cm in an adult rat. Tumor endpoints should also take into account the location of the tumor and the ability of the animal to ambulate. In addition, an endpoint is reached if the tumor ulcerates or is necrotic.
- ***Abdominal Distension*** – Animals will have enlarged abdomens and may have a difficult time breathing and/or ambulating.
- ***Other clinical signs that may lead to an humane endpoint, depending on severity and duration*** – Diarrhea, progressive dermatitis, jaundice and/or anemia, neurologic signs, bleeding from any orifice, self-trauma, circling or head tilt, limb paralysis, any condition interfering with eating or drinking, excessive or prolonged hyperthermia or hypothermia, prolapse of genitals or anus, malocclusion, and not response to external stimuli.

Other considerations for Establishing a Humane Endpoint

Moribund Condition and Death as an Endpoint

Moribund is defined as the condition that occurs immediately prior to death. The moribund state is preferred to death as an endpoint because it is assumed that euthanizing a moribund animal will help reduce terminal pain and/or distress; however defining morbidity is usually subjective. The continuation of a study until an animal dies requires strong scientific justification.

Endpoints in Behavioral studies

In all behavior studies and tests, proposed procedures for monitoring, record keeping and humane intervention must be described in the animal care and use protocol. A baseline behavioral profile of an animal should be established if changes in behavior are going to be used to monitor the animal for distress. An understanding of the species-typical behavior of the animals used in awake, behaving experiments is critical for adequately assessing the animal for signs of stress/discomfort that may be minimized either through an earlier endpoint determination or by modifying experimental procedures. Subtle changes detected in the animal's demeanor or its willingness to work in a study or sudden changes in performance on behavioral tasks may be the first indicators of a health problem that should be investigated.

Surgery and post-procedural recovery

The investigators will need to address monitoring frequency for post-procedural recovery for potential pain and/or distress in the animal care and use protocol.

Pilot Study

The selection of appropriate humane endpoints requires a detailed knowledge of the impact of the procedures on the animal. The IACUC reserves the right to request a pilot study if these factors are unknown.