



INSTITUTIONAL ANIMAL CARE  
AND USE COMMITTEE

## IACUC POLICY # 5

# IACUC Guideline on Endpoints in Animal Use Proposals

**moribund** \MOR-uh-bund\, *adjective*:

1. In a dying state; dying; at the point of death.

**morbid** \Mor-bid\, *adjective*: pertaining to, affected with, or inducing disease; diseased.

Experimental studies may involve procedures that cause clinical symptoms or morbidity in animals. Ideally, studies should be terminated when the animals begin to exhibit clinical signs of disease (morbidity) if these endpoints are compatible with meeting the research objectives. Such endpoints minimize pain or distress and are preferable to death or moribundity as endpoints which can involve considerably more pain or distress.

Although infrequent, allowing animals to become moribund or die as endpoints may be necessary for some research projects. The moribund condition is defined as a clinically irreversible condition leading inevitably to death. In these studies, animals are permitted to die or become moribund as a result of experimental procedures, in some cases without the use of pain relieving measures, because such measures may compromise the integrity of the study.

It is the policy of the Institutional Animal Care and Use Committee (IACUC) that studies requiring moribundity or death as the endpoint will not be approved without specific written scientific justification. Animals that become moribund will be humanely killed by approved methods.

In those cases where death is the only acceptable endpoint, the investigator must provide an explicit explanation for this endpoint. Particular attention should be paid to providing the rationale for not humanely killing moribund animals, e.g., what additional scientific information will be gained.

**Animal Study Proposals utilizing death or moribund condition as an endpoint should contain the following information:**

1. The scientific rationale for death or moribund condition as an endpoint, including:
  - A. What alternatives were considered, why morbidity as an endpoint cannot be used, and how alternatives will be used whenever possible.
  - B. Why pain relieving measures cannot be utilized.
  - C. Number of animals to be used and why this is the minimal number of animals required.
  - D. Whether animals will be euthanized when moribund and if not, what information is to be gained in the interval between moribundity and death.
2. A plan for the following animal care and monitoring procedures:
  - A. Animals involved in experiments that may lead to a moribund condition or death will be monitored daily by personnel experienced in recognizing signs of morbidity (illness, injury, or abnormal behavior) for at least the following: abnormal posture, rough hair coat, head tucked into abdomen, exudate around eyes and/ or nose, skin lesions, or abnormal breathing, difficulty with ambulation, decreased food or water intake, or self mutilation.
  - B. The frequency of observation will be increased (including on weekends and holidays) when animals exhibit the above or other signs of moribundity. Designated personnel, including a veterinarian, should be notified as soon as animals show signs of disease. An assessment of the animals' condition should be made as soon as possible and a plan of action established.
  - C. Consideration will be given to moving animals to individual cages when their condition deteriorates to the point that injury from other animals is likely. Dead animals must be promptly removed.
  - D. Written records will be kept of monitoring.

## **Recognizing Signs of Morbidity and Moribundity**

The following are signs and symptoms for judging morbidity (disease/illness) and moribund condition (state of dying) in animals:

### **Morbidity**

1. Rapid breathing rate
2. Breathing rate very slow, shallow, and labored (preceded by rapid breathing)
3. Rapid weight loss
4. Ruffled fur (rough hair coat)
5. Hunched posture
6. Body temperature less than 30°C (hypothermia) or
7. Hyperthermia
8. Ulcerative dermatitis or infected tumors
9. Anorexia (loss of appetite)
10. Diarrhea or constipation

### **Moribund Condition**

Signs and symptoms for morbidity plus:

1. Impaired ambulation (unable to reach food or water easily)
2. Evidence of muscle atrophy or other signs of emaciation (body weight is not always appropriate)
3. Any obvious severe illness including such signs as lethargy (drowsiness, aversion to activity, lack of physical or mental alertness), anorexia (loss of appetite, especially when prolonged), bleeding, difficulty breathing, CNS disturbance, or chronic diarrhea
4. Inability to remain upright
5. Loss of consciousness
6. Drop in body temperature below 28°C for a prolonged period (6 hours).