Part I – Euthanasia as an Alternative to Death as an Endpoint in Rodents

1. Background Information
   A. Legal, regulatory, and moral guidelines require that animal pain, distress, and suffering be minimized in any experiment. For these reasons, investigators are strongly encouraged to administer euthanasia in death-end-point experiments prior to actual death of the animals - if experimental validity will not be compromised. These objectives assume that investigators can differentiate between animals that are morbid (i.e., affected with disease or illness), and those that are moribund (i.e., in the state of dying).
   B. The University of Arlington (UTA) Institutional Animal Care and Use Committee (IACUC) believes that an investigator can judge and should perform euthanasia on moribund rodents based on objective signs or symptoms of dying depending on experience with the animal model, professional judgment, and the experimental protocol. The combination of signs of symptoms indicating euthanasia may vary with experimental end point.
   C. The IACUC guidelines indicate that animals found moribund should receive euthanasia,. The use of death as an endpoint is discouraged and must always be justified. Endpoints other than death must always be considered and should be used whenever the research objective can be attained with non-lethal endpoints. Use of death as an endpoint must be justified in writing in proposals and its use must be approved by the IACUC prior to beginning a study. (See ARENA/OLAW IACUC Guidebook, pp. 106-107)
   D. Investigators are expected to make a good faith effort to justify their end points, or agree they can judge when to perform euthanasia on animals found moribund in a particular protocol. Moreover, all investigators are expected to continue to monitor animals according to detailed plan described in protocol, to euthanize any animals which they judge should receive euthanasia, to use alternative end points to death when possible, and to minimize animal numbers within statistical constraints in general, but especially in death-end-point protocols.

2. Responsibilities – All investigators are expected to:
   A. Use alternative end points when possible.
   B. Minimize animal numbers within statistical constraints.
   C. Describe detailed post-procedure monitoring plan for animals in IACUC protocol.
   D. Euthanize any animals found in a moribund state except when death is the end point as approved by the UTA IACUC.
E. Describe detailed criteria for human endpoints in IACUC protocol. (See Part III)

F. Monitor for Signs and Symptoms for Judging Morbidity (disease/illness) in Rodents
   i. rapid breathing rate
   ii. breathing rate very slow, shallow, and labored
   iii. rapid weight loss
   iv. hunched posture
   v. hypo- or hyperthermia
   vi. ulcerative dermatitis or infected tumors
   vii. anorexia (loss of appetite)
   viii. diarrhea or constipation

G. Monitor for Signs and Symptoms for Judging the Moribund Condition (state of dying) in Rodents. Signs and symptoms of morbidity will be observed plus:
   i. impaired ambulation (unable to easily reach food or water)
   ii. evidence of muscle atrophy or other signs of emaciation (body weight is not always appropriate, especially since tumors may artificially increase body weight)
   iii. any obvious illness including such signs as lethargy (drowsiness, aversion to activity, lack of physical or mental alertness), prolonged anorexia, bleeding, difficulty breathing, central nervous.
   iv. Inability to remain upright

Part II - Euthanasia by Cervical Dislocation or Decapitation (Complies with the American Veterinary Medical Association of (AVMA) Guidelines for the Euthanasia of Animals: 2020 Edition recommendations on euthanasia by cervical dislocation or decapitation.)

1. Cervical Dislocation
   A. This method of euthanasia shall only be used in poultry, small birds, mice, rats weighing
   B. <200g, and rabbits weighing < 1kg.
   C. Cervical dislocation may be used unconditionally in the above mentioned species if the animal is first anesthetized. Without prior anesthetization, this method may be only used when scientifically justified by the user and approved by the UTA IACUC. Prior use of this method of euthanasia by the investigator shall not be deemed as scientific justification.
   D. If the UTA IACUC approves this method for use without prior anesthesia, at the discretion of the UTA IACUC or the UTA Attending Veterinarian (AV), the UTA AV shall observe the personnel performing the cervical dislocation to ensure that the personnel have properly trained.

2. Decapitation
   A. This method of euthanasia shall only be used in laboratory rodents, rabbits weighing
B. <1kg, birds, fish, amphibians, and reptiles.
C. Decapitation may be used unconditionally in the above species if the animal is anesthetized.
D. The equipment used to perform decapitation should be maintained in good working order and serviced on a regular basis to ensure sharpness of blades. The use of plastic cones to restrain animals appears to reduce distress from handling, minimizes the chance of injury to personnel, and improves positioning of the animal in the guillotine. (See separate IACUC Guillotine Maintenance SOP.) Without prior anesthetization, this method may only be used when scientifically justified by the user and approved by the UTA IACUC. Prior use of this method of euthanasia by the investigator shall not be deemed as scientific justification.
E. If the UTA IACUC approves this method for use without prior anesthesia, at the discretion of the UTA IACUC or the UTA AV, the UTA AV shall observe the personnel performing the decapitation to ensure that they have been properly trained.

3. Justification
A. Acceptable scientific justification for cervical dislocation or decapitation may be accomplished by one of the following methods:
   i. A small pilot study consisting of 6-10 animals per group may be incorporated into the IACUC protocol to test for significant differences between physical methods (i.e., gas inhalation [carbon dioxide or isoflurane] or injectable euthanasia agent overdose). The results of the pilot study would then be reviewed by the UTA IACUC before granting final approval to use physical methods of euthanasia.
   ii. Results of a literature review must be submitted with the IACUC protocol.
   iii. The review should demonstrate that the AVMA approved methods would not work in the specific study being reviewed.

Part III – Criteria for Euthanasia of Animals (Humane Endpoints)

1. Guidelines: When an animal meets any of the following criteria, it should be considered for euthanasia:
   A. Prostration – Animal is consistently unwilling/unable to stand.
   B. Paralysis – Unwilling/unable to use limbs. Positive controls on neurotoxicology studies should be handled on an individual case basis.
   C. Central nervous system disorders such as head tilt, incoordination, ataxia, tremors, spasticity, seizures, circling, or paresis. Positive controls on neurotoxicology studied should be handled on an individual case basis.
   D. Severe weight loss/emaciation – Animal has not consumed an appreciable amount of food for a time sufficient to produce substantial weight loss (acute loss of 20-25% body weight less than 1 week or chronic gradual but continuous decline in body weight), and/or cannot be encouraged to eat by dietary changes (when permitted).
E. Labored breathing – Animal appears to have difficulty breathing.
F. Persistent coughing, wheezing and respiratory distress which cannot be resolved by therapy.