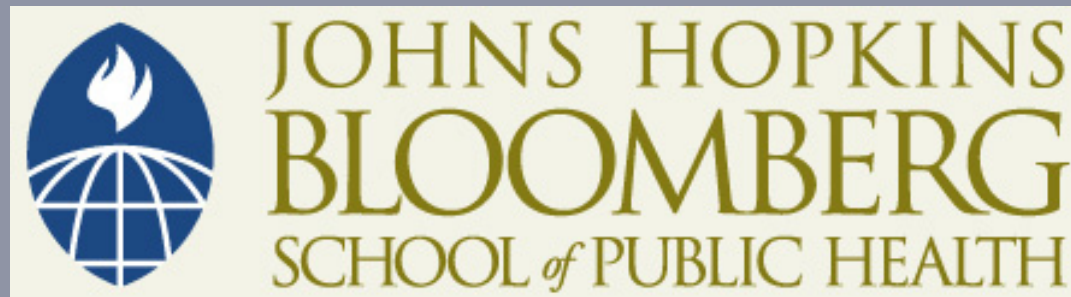


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Section B

Humane Endpoints

Concept of Humane Endpoints

- What is a humane endpoint?
- The earliest point to terminate an experiment or humanely kill an animal to obtain the maximum scientific outcome without causing undue pain or distress to the animal

Concept of Humane Endpoints

- Why establish endpoints?
 - To avoid undue pain or distress
 - To reduce pain or distress

Endpoint Parameters

- Easily identifiable actual or imminent signs of decline in an animal's behavior

Endpoint Parameters

- Endpoints should be animal or model specific
- Describe the changes that may occur in the animal due to experimental conditions and/or natural illnesses
- A humane endpoint should clearly predict or indicate stress, pain, and death

Endpoint Parameters

- Humane endpoints may seem to conflict with experimental endpoints as the use of a humane endpoint may also end the study
- The goals of PIs, veterinarians, and IACUCs is to balance the scientific needs with the humane treatment of the animals
- In a new experiment, watch a few animals and use clinical, behavioral, and biochemical score sheets (pilot studies may be needed)

Endpoint Parameters

- Care should be taken when considering the early termination of a study if this also creates the potential waste of an animal's life
- Animals should not be allowed to experience pain or distress beyond that necessary for the study
- Ideally, humane endpoints are based on objective criteria and professional judgment

Endpoint Parameters

- They should be easily identifiable by any staff member in contact with the animals
- The established humane endpoints should be clearly defined in the animal-use protocol submitted to the IACUC
- In genetically modified experiments, unexpected changes may occur in the animals
- The PI should predict possible outcomes and develop humane endpoints, depending on the known behavior of the gene

Who Decides That the Endpoint Has Been Reached?

- An individual with the authority to determine when an endpoint has been reached should be designated
- This individual should be well trained in the normal and abnormal behavior of the species
- It should be clear who has the authority and responsibility to carry out the euthanasia

Who Decides That the Endpoint Has Been Reached?

- This person should be listed in the protocol, and someone with this authority should be available at all times (or the alternate must be available)
- The responsible veterinarian must have the full authority to carry out the humane euthanasia, although ideally this decision would be made with the consensus of the research team

Categories of Humane Endpoints

- Biologic markers, e.g., development of paralysis in models of neural tumors
- Markers of therapeutic failure, e.g., persistent tumor growth with drugs
- Markers of disability, e.g., inability to stand in models of bacterial endotoxemia
- Markers of disease exacerbation, e.g., increase in seizure frequency
- Markers of general deterioration, e.g., changes in body weight, temperature, respiration, etc.

