HUMANE ENDPOINTS

1. The experimental endpoint "occurs when the scientific aims and objectives have been reached". In some circumstances before the experimental endpoint is reached however, an animal may experience significant pain or distress. At this point where the pain or distress of the animal is prevented, terminated or relieved by taking actions such as euthanizing the animal, terminating the painful procedure or giving treatment to relieve the pain and/or distress, is called the humane endpoint (HEP).

2. Before the experiment begins, thought should be put towards determining when the HEP should be considered to be reached. Commonly used HEP criteria include:

   General Well-Being
   - Decrease of body weight of more than 20% from baseline
   - Muscle atrophy or emaciation with a body condition score of less than 2
   - Reduced response to external stimuli
   - Moribund, unconscious or comatose
   - Prolonged or irreversible inability to eat or drink
   - Persistent facial displays of pain & distress (i.e. grimace scale score of 2)

   Tumour Studies
   - Tumor size exceeding 12mm in mice or 25mm in rats for passage studies, or 15mm and 28mm respectively for therapeutic studies
   - Tumour Ulceration
   - Bodyweight increase of 10% from baseline in situations of ascites or abdominal distension

   General Surgery
   - Signs of post-operative infection that cannot be cleared or wound breakdown that cannot be repaired

   Abnormalities of Body Systems and Homeostatic Mechanisms
   - Marked increase of respiratory effort or significantly abnormal breathing
   - Severe persistent hypothermia or hyperthermia (e.g. +/- 3oC from physiological norm)
   - Chronic deteriorating skin lesion, or ulcerative dermatitis lesions with a clinical score ≥ 75 (Hampton et al., 2012)
   - Chronic deteriorating ocular lesion (persisting for longer than 7 days) (e.g. corneal perforation or severe blepharitis)
   - Clinical signs of systemic disease (e.g. jaundice, anaemia, enlarged lymph nodes, etc.)

   Central or Peripheral Nervous System
   - Central nervous system disturbance (such as seizure activity or ataxia)
   - Paralysis
   - Self-Induced trauma/Self-mutilation leading to exposure of bone or body cavity

3. By default, it is assumed that all experiments will adhere to the above listed HEP criteria unless justification has been provided to and approved by CULATR. (Committee on the Use of Live Animals in Teaching and Research)

4. If animals are expected to approach HEP as specified in their CULATR protocol, the researcher(s) may be requested to perform regular scoring of their animals to more objectively determine the criteria for euthanasia before HEP is reached. Example of one such scoring card is as follows:

Humane End Point Score Card for Health Monitoring of Sick Animals (Animal ID:)															
Monitoring Start Date:		Initial body weight (g):					Body Weight after 20% loss (g):								
Begin scoring when animal starts to show signs of being unwell. Continue daily observation until animal recovers, or HEP reached															
Give a score of 2 if symptom is severe Give a score of 1 if symptom is mild Give a score of 0 if symptom is not present	Date														
	Body Weight (g)														
	Lethargic, depressed or unresponsive to gentle stimuli														
	Rough unkempt hair coat, hunched posture														
	Coughing, labored breathing, cyanosis or anaemia														
	Discharge from any orifice, e.g. blood stained or mucopurulent														
	Muscle wastage, poor body condition, dehydrated														
	Progressive dermatitis, or other skin lesions or swellings														
	Total Score														
	Signature of CCMR User														
	Signature of CCMR Staff														
HEP reached if despite veterinary treatment: (1) Animal reaches 20% of original body weight loss, or (2) A total score of ≥ 6 on any given day, or (3) A total score of ≥ 4 on three consecutive days															

5. If the established HEP is approaching, but the researcher has scientifically justifiable reasons to extend beyond the approved HEP, a CCMR veterinarian must be consulted. Only under the direction and treatment e.g. analgesia, prescribed by the veterinarian may animals exceed established HEP. In such circumstances a plan and justification must be provided by the PI/team member(s) as soon as possible indicating the schedule for follow-up observations/treatment and the criteria for euthanasia.

6. In principle, death should not be used as an endpoint in any experiment or test. If death is proposed as an endpoint in a project, it must be scientifically justified and approved by the CULATR.

7. Researchers who use animals for scientific purposes have direct/ultimate personal responsibility for all matters relating to the welfare of the animals they use. The principal investigator (PI) and his/her team member(s) (the "researchers") are responsible for monitoring the well-being and carrying out the post-operative observation/care of the animals on a daily basis. The default must always be to protect the welfare of the animals.

8. For further details on HEP, please refer to the following documents:

   a) Canadian Council on Animal Care CCAC guidelines on choosing an appropriate endpoint in experiments using animals for research, teaching and testing (1998)
   b) ILAR Report: Humane endpoints for animals used in biomedical research and testing
   c) NIH Guidelines for Endpoints in Animal Study Proposals
   d) Veterinary Care for Laboratory Animals, CCMR
   e) Code of Practice for Care and Use of Animals for Experimental Purposes, AFCD (2004)
   f) Hampton AL, Hish GA, Aslam MN, et al. Progression of ulcerative dermatitis lesions in C57BL/6Crl mice and the development of a scoring system for dermatitis lesions. *J Am Assoc Lab Anim Sci*. 2012;51(5):586-593.