Rodent Tumor Policy

| Tumor-related experiments in rodents are an important component in many research protocols investigating cancer biology and therapy; however, these protocols present distinct clinical concerns and endpoints. These guidelines describe limits for tumor burden and related humane endpoints for mice and rats bearing spontaneous or implanted tumors, with the objective of limiting, terminating, or relieving unnecessary pain, discomfort, or distress in these animals (NRC, 2011). |

**Tumor Size:** In an adult mouse, any measurable subcutaneous tumor on the dorsum or upper thigh should not exceed 20 mm in any dimension. In an adult rat, any measurable subcutaneous tumor on the dorsum or upper thigh should not exceed 40 mm in any dimension. Tumors in other locations (such as ventral abdomen, mammary gland, face, tongue, and foot) may cause significant distress or become inflamed/ulcerated at sizes smaller than those allowed for tumors on the dorsum and upper thigh. The maximum allowed size for tumors in these locations should be discussed with the clinical veterinarian and stated on the approved protocol.

If imaging is performed, any measurable internal tumor should not exceed these limits. However, investigators will not be required to add imaging and may utilize alternative humane endpoints as described below.

Internal tumors may require a substantially smaller maximum allowed size depending on the location of the tumor, which should be stated in the AWC-approved protocol.

For animals with multiple masses, the total tumor burden is calculated by the summation of all measurable masses and is not to exceed the limits stated above.

The presence of tumors exceeding these size limits will be considered a humane endpoint and a criterion for euthanasia. Any exceptions to these tumor-size limits must be scientifically justified in the corresponding AWC-approved protocol, with alternative endpoints clearly indicated.

Investigators may describe alternate methods for assessing and measuring tumor burdens in rodents; such methods, and corresponding humane endpoints, must be described in the approved protocol.

**Ulceration:** Certain subcutaneous tumors may have tendency to ulcerate, depending on size and origin. Ulceration is defined as a complete disruption of the epidermal skin layer, resulting in exposure of underlying dermis or subcutaneous tissue. Presence of a tumor with an ulcer greater than pinpoint (1-mm) size is considered a humane endpoint for euthanasia.
Any exceptions to allow for greater ulceration of tumors must be scientifically justified in the AWC-approved protocol, with alternative humane endpoints indicated. Treatment of tumors with ulcers greater than 2 mm is recommended, which may reduce the progression and provide relief to the subject. Such interventions should be described in the AWC protocol. Possible treatments may include, but are not limited to: use of paper bedding, topical antibiotic ointment, and analgesics.

**Endpoints:** In addition to tumor size and ulcerations, other humane endpoints may be cause for euthanasia or veterinary intervention and may include, but are not limited to, the following. These endpoints may be listed in the AWC protocol.

- Necrosis, infection, or bleeding of tumors
- Decreased body condition (Body Condition Score ≤ 2 of 5)(Ullman-Cullere & Foltz, 1999)
- Respiratory distress
- Lethargy or listlessness
- Inability to reach food or water
- Hunched posture
- Facial grimace
- Abdominal distension
- Bloodstained or mucopurulent discharge from any orifice

**Monitoring:** Once palpable tumors develop, animals must be monitored at least once per week by the PI staff. If exceptions to tumor-size or ulceration size-limits are requested (see above), tumors must be monitored at least two times per week once tumors or ulcers reach 50% of the requested maximum size. These records are to be kept by PI staff and are to be made available at the request of the veterinary staff.

Any exceptions to these monitoring requirements must be scientifically justified in the AWC-approved protocol. More frequent monitoring may be requested by the AWC for implanted tumors that are known to have a rapid growth rate or high potential for metastasis.

**References:**


To obtain a body condition score, place the animal on the wire top of the cage. Assess the vertebrae by palpating (examining by touch) the length of the spine. Assess the pelvic bones by palpating the hips.

**BC 1**
Mouse is emaciated.
- *Skeletal structure extremely prominent; little or no flesh cover.*
- *Vertebrae distinctly segmented.*

**BC 2**
Mouse is underconditioned.
- *Segmentation of vertebral column evident.*
- *Dorsal pelvic bones are readily palpable.*

**BC 3**
Mouse is well-conditioned.
- *Vertebrae and dorsal pelvis not prominent; palpable with slight pressure.*

**BC 4**
Mouse is overconditioned.
- *Spine is a continuous column.*
- *Vertebrae palpable only with firm pressure.*

**BC 5**
Mouse is obese.
- *Mouse is smooth and bulky.*
- *Bone structure disappears under flesh and subcutaneous fat.*

A "+" or a "−" can be added to the body condition score if additional increments are necessary (i.e. ...2+, 2, 2−...).