GUIDELINES FOR USE AND APPLICATION OF A SCORE SHEET

Research Ethics and Integrity
Animal Ethics

THE UNIVERSITY OF QUEENSLAND
AUSTRALIA
CREATE CHANGE

Investigator responsibilities relative to monitoring

See the "Monitoring animals" section of the Animal Ethics webpage, and refer to Clauses 2.4.18(vi-viii), 2.4.20(ii), and 2.4.31-32 of the Australian Code for the Care and Use of Animals for Scientific Purposes (the Animal Use Code) 8th edition, 2013 (updated 2021).

Choosing a "standard" score sheet, or using your own score sheet

The "standard" score sheets, available via the "Monitoring animals" section of the Animal Ethics webpage, have been developed as a tool to help standardise score sheets across UQ's operations. UQ's Animal Ethics Committees (AECs) are familiar with these "standard" score sheets.

Although these "standards" exist, the application of a score sheets should always be considered on an individual project basis, e.g. ask yourself, "is this score sheet appropriate for my model?", "are there other symptoms that I expect to see in my model that are not captured in this score sheet?". In some cases, the "standard" score sheets may need to be amended or entirely replaced to better suit your specific project or activity. Under such circumstances you must consult with the Veterinary Officer so that they can review and provide advice relative to your proposed points of difference.

Using score sheets in an ethics application

Score sheets are specific to each project. A score sheet must have been attached to the animal ethics application (and accepted by the AEC) for it to be valid, relative to the approved project. i.e. monitoring parameters (e.g. activity and responsiveness, body weight, etc), intervention points, and humane endpoints, cannot be changed without prior review and approval from the relevant AEC.

If a score sheet is proposed to the AEC which implies a potential increase in level of impact to animal wellbeing beyond that identified in the "standard" score sheets (e.g. max. 15% body weight loss is increased to max. 20% body weight loss) the AEC will expect specific justification for this change to be provided within the ethics application.

Using score sheets in operation

When operating within an animal facility, animal technicians should be provided with a copy of your score sheet (usually as a printout within the room, proximate to where the animas are housed). Further to this, if paper-copy monitoring records are being used (relative to the score sheet), ideally these are also contained within the room, proximate to where the animas are housed.

The template used for monitoring records can be amended to suit investigator or animal facility staff preference, however, the monitoring parameters (e.g. activity and responsiveness, body weight, etc), intervention points, and humane endpoints, cannot be changed without prior review and approval from the relevant AEC. For example, some laboratory groups will record all observations directly into a shared Excel file (also shared with animal technicians).

Some guiding points for rodent model score sheets

- Specific models may require specific monitoring criteria. The following are monitoring considerations relative to specific models, many of which are covered in the "standard" score sheet criteria:
    - Arthritic disease – pain*, body posture, joint inflammation (swelling, redness, lameness), ambulatory function (i.e. gait);
    - Liver disease - abdominal pain, body posture, liver function, including body weight, body condition, jaundice and elevation of serum biomarkers of hepatic function (if available);

- Renal disease - abdominal pain, body posture, and renal function, including water input, urine output, urine specific gravity, and elevation of serum biomarkers of renal function (if available);
- Bone tumours – pain, observation of tumour size (e.g. semi-quantitative assessment of size from IVIS imaging & measurement of width using Vernier callipers), localised skin inflammation
- Metastatic tumours – pain, respiratory function, white cell levels and other biomarkers (blood-based)

*pain can be assessed through general observations (facial grimace, body posture, activity levels) as well as gentle palpation of the area suspected to be painful.

- Analgesia – Remember that rodents "hide" their pain very well. Pain relief must be provided wherever reasonably appropriate for the model – this should be considered as an 'intervention point'. Models which incur chronic pain, such as that experienced in models of arthritis, may be amenable to supplementing food, water or novel jelly products with pain relieving drugs (e.g. low-dose buprenorphine impregnated jelly, or children's paracetamol within the drinking water).
- Subcutaneous tumours – Subcutaneous tumours measuring ≥1000mm3, or subcutaneous tumours causing dermal ulceration are almost exclusively considered a humane endpoint. The standard method for estimating tumour volume uses Vernier callipers, measuring length (L) and width (W) then applying the following formula: ½ x (L x W x W), as per Faustino-Rocha et al., 2013.
- Body weight loss – for most rodent models 15% loss of body weight over the duration of the experiment is considered a humane endpoint. It is however appreciated that in some models, body weight loss >15% will be required to achieve valid scientific outcomes. The "standard" score sheets accommodate this to a limited extent, see "Enteropathy - score sheet for mice with risk of enteropathy (e.g. post irradiation or DSS exposure)". Weight loss greater than these established levels requires specific justification detailed within the ethics application. (Please note: there is an important distinction between acute and chronic weight loss)

Recommended Reading

Expert Working Group (Animal Welfare Body of the European Commission). Examples to illustrate the process of severity classification, day-to-day assessment and actual severity assessment. 2013. European Commission. [Cited 1 Mar 2021]. Available from: https://ec.europa.eu/environment/chemicals/lab_animals/pdf/examples.pdf

Expert Working Group (Animal Welfare Body of the European Commission). Working document on a severity assessment framework. 2012. European Commission. [Cited 1 Mar 2021]. Available from: https://ec.europa.eu/environment/chemicals/lab_animals/pdf/Endorsed_Severity_Assessment.pdf

Hawkins P, Morton DB, et al.; UK Joint Working Group on Refinement BVAAWF/FRAME/RSPCA/UFAW. A guide to defining and implementing protocols for the welfare assessment of laboratory animals: eleventh report. 2010. [Cited 1 Mar 2021]. Available from: https://www.rspca.org.uk/webContent/staticImages/Downloads/WelfareAssessmentProtocolsFull.pdf

Institute for Laboratory Animal Research (ILAR) Journal, Humane Endpoints for Animals Used in Biomedical Research and Testing, Volume 41, Issue 2, 2000. https://academic.oup.com/ilarjournal/issue/41/2, including:

Coenraad FM, Hendriksen BS. Refinement of Vaccine Potency Testing with the Use of Humane Endpoints. ILAR J. 2000;41(2): 105–113. doi: 10.1093/ilar.41.2.105

Morton DB. A systematic approach for establishing humane endpoints. ILAR J. 2000;41(2):80-6. doi: 10.1093/ilar.41.2.80

Olfert ED, Goodson DL. Humane endpoints for infectious disease animal models ILAR J. 2000;41(2): 99-104. doi: 10.1093/ilar.41.2.99

Wallace J. Humane Endpoints and Cancer Research, ILAR J. 2000;41(2): 87–93. doi: 10.1093/ilar.41.2.87

Mei J, Banneke S, Lips J, Kuffner MTC, Hoffmann CJ, Dirnagl U, Endres M, Harms C, Emmrich JV. Refining humane endpoints in mouse models of disease by systematic review and machine learning-based endpoint definition. ALTEX. 2019;36(4):555-571. doi: 10.14573/altex.1812231

Ray MA, Johnston NA, Verhulst S, Trammell RA, Toth LA. Identification of markers for imminent death in mice used in longevity and aging research. J Am Assoc Lab Anim Sci. 2010 May;49(3):282-8. PMID: 20587157; PMCID: PMC2877298.

Paster EV, Villines KA, Hickman DL. Endpoints for mouse abdominal tumor models: refinement of current criteria. Comp Med. 2009 Jun;59(3):234-41. PMID: 19619413; PMCID: PMC2733284.