How to determine humane endpoints for research animals
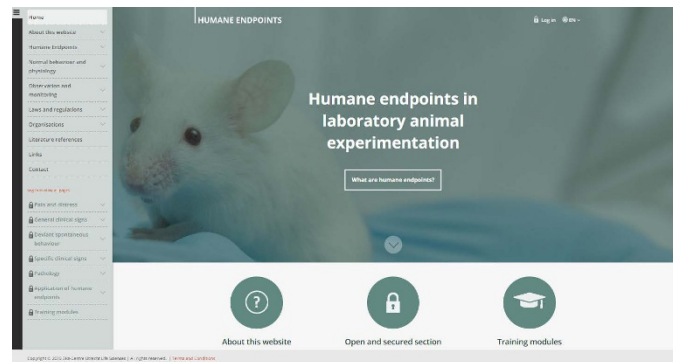
The website "Humane endpoints in laboratory animal experimentation" is a rich resource with information to help researchers define and implement humane endpoints when planning research with laboratory animals. Now, as a project of the 3Rs-Centre Utrecht Life Sciences, the site is updated with photo illustrations, short videos, links to other websites and downloadable sample datasheets.

The website is divided into public pages that are free for all to view and restricted-access pages that require login credentials, once a member has been approved by the owner of the site. The public portion of the website contains information on how humane endpoints are used to plan experiments, alongside information on mouse and rat behavior with external links. The restricted-access portion has more in-depth information on behavior, physiology, pathology, physical exams and how to determine when an animal should be euthanized. There are training modules in the restricted-access portion of the website as well.

The homepage, with a large photo of a mouse, centers on a link, 'What are humane endpoints', which leads readers to a subpage on definitions for humane endpoints. Below that, there are more links with information about the website and how to register for access to the restricted sections and training modules. The left-hand side of the homepage, which contains links to the bulk of the website's content, expands to show several additional topics and related subtopics. Some are only accessible after registration and are clearly marked. The links to publicly accessible topics lead to well organized pages featuring key concepts, definitions, pictures and videos to help guide the reader. Additionally, each page has terms highlighted in grey that link to definitions in an internal glossary.

The overall purpose of the public portion of the website is to inform readers about what humane endpoints are and how they can be used in animal research. This public material also explains some of the important areas of research wherein animal models are used—cancer, toxicity studies, vaccine potency, infectious disease and autoimmune disease—and the various levels of pain and distress that animals can experience. The material further points out that there are moral, scientific and legal considerations in determining the humane endpoint for an animal in research.

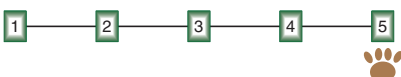The restricted portion of the website features information and training modules on several topics, all intended to help researchers, veterinarians and animal caregivers in identifying pain and distress in animals and making informed and humane decisions regarding euthanasia. Specific topics range from 'pain and distress' to 'deviant spontaneous behavior'. A subsection on 'types of analgesia' gives examples of when analgesia is necessary, the specific types of analgesics typically used (opioids, local analgesics and non-steroidal anti-inflammatory drugs) and includes tables detailing dosages of different types of opioids and non-steroidal anti-inflammatory drugs for mice and rats. There are also links to multiple score sheets for assessing the health status or monitoring the welfare of rodents. Scoring health parameters on a regular basis gives caregivers and researchers a tool to determine if an animal is in distress or pain, which enables more accurate and consistent decisions concerning humane endpoints and euthanasia.
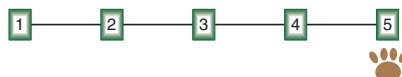
This is a superb site with material that can be used as a quick reference, a long read or study material as part of a class. It is available in English, Dutch and French, with a Spanish version expected by the end of 2015 and a German version by July of 2016. At the time *Lab Animal* visited, the training modules were fully functional only with Internet Explorer or Google Chrome and were provided only in English. As this site continues to grow it will no doubt become a useful and ubiquitous source of information for lab animal scientists throughout the world.

https://www.humane-endpoints.info/en

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