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## Policies & Perspectives

### FOCUS ON DISTRESS

Koch (2006, *Lab Animal*, 35(5): 27–32) discusses distress of research animals from a variety of perspectives—definition, recognition and alleviation, and relevant U.S. federal mandates. The author suggests shifting focus from pain to pain-related and non-pain-related distress; developing science-based criteria to define *significant* distress; and giving the animals the benefit of the doubt where necessary. Koch also recommends using “consumer demand” studies—which determine how hard an animal will work to escape or avoid a situation—to define levels of distress, given that Animal Welfare Act (AWA) regulations do not give criteria for determining when non-pain-related distress exceeds *slight* or *momentary* and becomes *significant*. The author further states that the failure of the U.S. Department of Agriculture (USDA) to define distress causes inconsistency in determining when non-pain-related distress should have regulatory significance. Koch states that in research that is expected to cause significant distress, the investigator should search for alternatives and either relieve distress (at least to slight or momentary levels) or provide scientific justification for not doing so. Failure to identify distress not caused by pain triggers failure to minimize it, contrary to the intent of the AWA, Koch states. Facility annual reports to the USDA should report all animals experiencing unrelieved distress in excess of slight or momentary levels, even if mild.

The Humane Society of the United States (HSUS) has been urging the USDA to provide a regulatory definition of “distress” for many years. The USDA published a request for public comment on this issue in 2000 but has taken no formal action to date. The HSUS hosted a workshop of experts to discuss this and other distress-related issues (for the workshop summary, see *Lab Animal*, 2006, 35(8): 26–30). While the experts had difficulty defining distress, they did develop a description and accompanying examples that could serve as a starting point for the USDA to formulate a regulatory definition of distress.

### BARRIERS TO PAIN ASSESSMENT AND TREATMENT

Adapting from a roundtable discussion at the 2003 American Association for Laboratory Animal Science (AALAS) National Conference, Karas (2006, *Lab Animal*, 35(7): 38–45) summarizes barriers to pain reduction in laboratory animals, the relative importance of each barrier, and approaches to overcoming them. The approximately 50 workshop participants voted on how to allocate a hypothetical \$1 million to address laboratory animal pain. Listed in order of the percentage of funding the participants allocated (from highest to lowest), pain barrier categories included institutional support of veterinarians, technicians, and Institutional Animal Care and Use Committees (IACUCs) (52%); lack of widespread knowledge of effective techniques to assess, monitor,

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The Pain & Distress Report  
is available online at  
[humanesociety.org/pain\\_distress\\_report](http://humanesociety.org/pain_distress_report).



THE HUMANE SOCIETY  
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and treat pain (24%); understaffing and insufficient overnight care and oversight (18%); and extent of investigators' knowledge about, or personal attitudes toward, pain in animals (6%). Participants did not allocate any hypothetical funding to two identified barriers: flawed IACUC processes and limitations of study design.

Some suggestions for overcoming these obstacles included adoption of performance standards, pilot studies using a few animals to assess the pain caused by a new technique compared to established techniques, review and implementation of a controlled drug policy, use of available resources on pain assessment, and individualized hands-on training in procedural and monitoring skills and literature searches. The author

concludes that this initial survey identified areas of concern and potential solutions and that a larger, more scientific survey of priority needs is necessary, but only after focused attention and funding is given to improving the understanding of animal pain, its treatment, and its effects on research.

## SCIENCE-BASED ASSESSMENT OF LABORATORY ANIMAL WELFARE

Baumans (2005, *Rev. Sci. Tech. Off. Int. Epiz.*, 24(2): 503–514) discusses science-based assessment of laboratory animal welfare, including environmental factors, legislative aspects of housing and care, and future trends such as the production and use of genetically modified animals and individually ventilated caging systems. The author concludes that no single parameter is all inclusive for assessing welfare and advises focusing on animals' environmental needs by implementing simple, standardized enrichment for each species. The author also recommends not overstating increased variation among subjects due to enrichment but instead balancing the potential variation with the animals' improved well-being. Baumans states that more data are needed on the effects of enrichment on species, strains and models, and experimental results. The author stresses the importance of describing enrichment protocols in scientific publications and of realizing that animal welfare is a prerequisite for reliable experimental results.

## Resources & Services

### HUMANE ENDPOINTS CD-ROM

Produced through an initiative of the Netherlands Association for Laboratory Animal Science (NVP), the *Humane Endpoints in Laboratory Animal Experimentation* CD-ROM aims to reduce and prevent pain and distress in rodents through training in the implementation of humane endpoints. The CD includes information on the characteristics of healthy mice and rats and their clinical signs, sample score sheets, criteria for developing and validating humane

endpoints, and international regulations and guidelines. It is available at [www.vet.uu.nl/nca/documents/humane\\_endpoints](http://www.vet.uu.nl/nca/documents/humane_endpoints).

## RSPCA/UFAW RODENT WELFARE MEETING SUMMARY

The 2005 annual meeting summary of the Royal Society for the Prevention of Cruelty to Animals (RSPCA) and the Universities Federation of Animal Welfare (UFAW) Rodent Welfare Group has been published (2006, *Lab Animal*, 35(9): 29–38). The summary covers changes in burrowing and nesting behavior as early indicators of sickness in mice; alleviation of pain and discomfort in rats with adjuvant arthritis; refinement techniques for breeding genetically modified rodents; and the use of ear notching instead of tail clipping for genotyping. A United Kingdom (UK) Home Office inspector also identified key points for implementing alternatives, such as regularly reviewing techniques, considering how refinement applies to the animals' lifetime experience, using best practices whenever possible, taking local factors into account, using a step-wise approach to making changes, using appropriate expertise, working as a team, creating training programs that address identification and implementation of new refinements, and discussing changes with regulatory bodies.

## From the Technical Literature

### NEUROPHYSIOLOGICAL TECHNIQUES TO ASSESS PAIN

Murrell and Johnson (2006, *Journal of Veterinary Pharmacology and Therapeutics*, 29(5): 325–335) reviewed the applicability of three neurophysiological techniques to pain assessment in animals. The techniques—raw electroencephalogram (EEG), the bispectral index (BIS), and somatosensory evoked potentials (SEP)—each measure cortical response to a pain stimulus and provide information about pain perception. Studies using these techniques may improve animal pain management and welfare in clinical and husbandry

## Recent Publications

Cooper, D. M., Hoffman, W., Wheat, N., & Lee, H. (2005). Duration of effects on clinical parameters and referred hyperalgesia in rats after abdominal surgery and multiple doses of analgesic. *Comparative Medicine*, 55(4): 344–353.

Morton, C. M., Reid, J., Scott, E. M., Holton, L. L., & Nolan, A. M. (2005). Application of a scaling model to establish and validate an interval level pain scale for assessment of acute pain in dogs. *American Journal of Veterinary Research*, 66(12): 2154–2166.

Reebs, S. G., & St-Onge, P. (2005). Running wheel choice by Syrian hamsters. *Laboratory Animals*, 39(4): 442–451.

Rivard, A. N., Simura, K. J., & Mohammed, S., et al. (2006). Rat intubation and ventilation for surgical research. *Journal of Investigative Surgery*, 19(4): 267–274.

Wells, D. J., Playle, L. C., & Enser, W. E. J., et al. (2006). Assessing the welfare of genetically altered mice. *Laboratory Animals*, 40(2): 111–114.

## Upcoming Conferences

### IACUC 101 & 201 PLUS

- ▶ Hosted by BioReliance, Invitrogen Bioservices
- ▶ July 18–19, 2007
- ▶ Gaithersburg, Maryland
- ▶ <http://grants.nih.gov/grants/olaw/workshop.htm>

### Laboratory Animal Welfare Training Exchange Biennial Conference

- ▶ August 8–10, 2007
- ▶ Boston, Massachusetts
- ▶ [www.lawte.org](http://www.lawte.org)

### 6th World Congress on Alternatives & Animal Use in the Life Sciences

- ▶ Hosted by the Japanese Society for Alternatives to Animal Experiments (JSAAE), The Alternatives Congress Trust, Inc. (ACT), and the Science Council of Japan (SCJ)
- ▶ August 21–25, 2007
- ▶ Tokyo, Japan
- ▶ [www.ech.co.jp/wc6](http://www.ech.co.jp/wc6)

### IACUC 101 & 201

- ▶ Hosted by the University of Idaho
- ▶ August 29–30, 2007
- ▶ Spokane, Washington
- ▶ <http://grants.nih.gov/grants/olaw/workshop.htm>

### “Three D’s” Conference—Development, Disaster, and Design

- ▶ Hosted by The AWEN Group, Inc.
- ▶ September 20–21, 2007
- ▶ Salem, Massachusetts
- ▶ [www.theawengroup.com/cprograin.html](http://www.theawengroup.com/cprograin.html)

### IACUC 101

- ▶ Hosted by the University of Cincinnati
- ▶ September 27, 2007
- ▶ Cincinnati, Ohio
- ▶ <http://grants.nih.gov/grants/olaw/workshop.htm>

situations. The EEG, which records electrical activity from electrodes on an animal’s head, is more difficult to interpret than the BIS, which yields a single number that is based on the EEG reading and can be correlated to sedation level. In SEP, a voltage/time plot represents noxious stimuli to the body. The complex technical nature of the EEG recording techniques and data analysis limits its applicability in a clinical setting, and recent evidence shows it is not a sensitive indicator of pain. But research studies using EEG and

SEP in controlled environments provide unique information on pain processing in animals, such as identification of brain structures involved in neural pain processing. The BIS has not yet been validated in animals but has potential for pain monitoring.

### CELL COLLECTION FOR GENOTYPING NEWBORN MICE

Zhang et al. (2006, *Molecular Genetics and Metabolism*, 89(1–2):

164–167) presented a novel method of obtaining DNA samples for genotyping animals. An oral speculum was applied with gentle pressure to hold open the mouths of 50 one-day-of-life (DOL1) neonatal mice during cell collection, and a microcentrifuge tube with a probe containing a spoon-shaped scoop fused to the lid was used to scrape the inside of each mouse pup’s cheek twice. The cell collector was immediately placed back in the microcentrifuge after collection. DNA extraction and polymerase chain reaction (PCR) performed on each cell suspension extracted enough DNA for as many as 50 PCRs from each buccal sampling. RNA and protein extractions and cell culturing could also be performed on these cells. This method of gentle cheek scraping could replace painful and invasive ear and tail clipping.

## Noteworthy

### 2007 NORTH AMERICAN ANIMAL WELFARE AND ALTERNATIVES AWARDEES

Recently, the Procter & Gamble Company (P&G) and The HSUS awarded the 2007 North American Animal Welfare and Alternatives Awards. University of Washington professor Elaine Faustman earned an award for her research into the development of *in vitro* systems for the evaluation of a variety of environmentally and occupationally relevant agents. The University of Guelph’s Dr. Patricia Turner earned an award for her contribution to undergraduate and postgraduate education and training of veterinarians in laboratory animal medicine. Each recipient received \$25,000, funded by P&G.

### PUBLIC POLICY PROGRAM ON ALTERNATIVES

Johns Hopkins University’s Center for Alternatives to Animal Testing (CAAT)

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**Pain  
&  
Distress  
Report**

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## Noteworthy

at the Bloomberg School of Public Health is using a recently received \$1.5 million grant from an anonymous donor to develop a new program in public policy, education, and outreach. The program is aimed at educating policymakers and legislators about the need for alternatives to animals in testing and research. It will work with partners in the animal welfare, environmental health, and scientific communities to foster a policy and legislative culture that values the lives of animals and promotes the most humane science possible. For more information, go to <http://caat.jhsph.edu>.

## Statistics on Animal Use Pain & Distress

### DUTCH ANIMAL USE STATISTICS FOR 2005

According to recently issued 2005 statistics for the Netherlands (2007, NCA (Netherlands Centre Alternatives to Animal Use) *Newsletter*, March, p. 15), a total of 612,809 animal experiments were performed in 2005—a 3% decrease from 2004. The number of experiments using chickens, fish, sheep, pigs, dogs, cats, amphib-

ians, reptiles, and mice decreased, while those using rats, other rodents, rabbits, ferrets, other carnivores, cattle, other mammals, and birds increased. Animals were used primarily for the development, production, and control of drugs, sera, vaccines, and medical or veterinary products for human or veterinary use (47%), followed by fundamental research (44%), toxicological research (5%), education and training purposes (2%), and diagnostics (1%) (due to rounding, percentages do not total 100).

## Helpful Websites

Recently, the Animal Care program of the USDA's Animal and Plant Health Inspection Service (APHIS) revised its *Research Facility Inspection Guide*. Revised topics include protocol review of multiple major survival surgery, inspection procedures, annual reports, unexpected incidences involving pain and distress, personnel qualifications and training programs, and electronic communications for IACUC activities. The guide is available online at [www.aphis.usda.gov/animal\\_welfare/rig.shtml](http://www.aphis.usda.gov/animal_welfare/rig.shtml).

The Altweb database on humane endpoints contains more than 200 resources relating to minimizing laboratory animal pain and/or distress by taking action such as providing a humane death, terminating painful procedures, and relieving pain and/or distress. The database is designed to help investigators find the earliest endpoint that is compatible with the scientific objectives of their research. It can be found at <http://apps2.jhsph.edu/altweb/humanelsearch.cfm>.

Current and past issues of the *Pain & Distress Report* are available at [humanesociety.org/pain\\_distress\\_report](http://humanesociety.org/pain_distress_report). Spread the word to your colleagues, including IACUC members, institutional veterinarians, principal investigators, research technicians, and animal care staff. To receive the electronic version as soon as it becomes available, write to [ari@humanesociety.org](mailto:ari@humanesociety.org).

## Pain & Distress Report

The *Pain & Distress Report* provides laboratory animal veterinarians, technicians, oversight committees, and others with up-to-date information on issues regarding pain and distress in laboratory animals.

E-mail [ari@humanesociety.org](mailto:ari@humanesociety.org) for a free subscription to the electronic version of the newsletter; copies are also available online at [humanesociety.org/pain\\_distress\\_report](http://humanesociety.org/pain_distress_report). Please share this report with your colleagues and IACUC members.

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