



Searching for Alternatives to Painful Procedures Used on Research Animals (March 2002)

NIH Principal Investigators (PIs), IACUC reviewers, and ARAC members are encouraged to use this guide when considering research alternatives to painful or distressful procedures on animals.

This guide serves as a tip sheet for preparation of the Literature Search for Alternatives Worksheet. NIH Librarians can assist in the creation of search strategies and use of databases available through the NIH Library website, as well as conduct searches on the Web or in fee-based databases.

Information Requirements of the AWA - 9CFR 2.31 (d), Final Rules and Regulations in the Federal Register, Vol. 54 (168), August 31, 1989, and Animal Care Policy #12 — Written Narrative for Alternatives to Painful Procedures April 14, 1997 are references for more stringent guidance.

Distress

“A state in which an animal cannot escape from or adapt to the external or internal stressors or conditions it experiences, resulting in negative effects upon its well-being.”

Painful Procedure

*Code of Federal Regulations, Title 9, Chapter I, Subchapter A, Animal Welfare
“...as applied to any animal means any procedure that would reasonably be expected to cause more than slight or momentary pain or distress in a human being to which that procedure was applied, that is pain in excess of that caused by injections or other minor procedures.”*

Alternatives

3 R's of Russell and Burch

The Principles of Humane Experimental Technique (1959)

Reduction - Minimize the number of animals used.

Refinement - Techniques to reduce pain and distress.

Replacement - Substitute animal with non-animal methods.

USDA Animal Care Policy #12

Written Narrative for Alternatives to Painful Procedures, April 14, 1997

The minimal written narrative should include:

- databases searched or other sources consulted
- date of the search and years covered
- key words and/or search strategy used

The IACUC should be able to readily assess:

- appropriateness of search topics
- thoroughness of the search

Search Evaluation

The PI Role

- Check terminology, strategy, sources, and dates of search
- Need to review the search before completing the protocol
- Assess and evaluate the alternative possibilities
- Be prepared to support the use or non-use of any alternatives in writing
- Keep a copy of strategy, databases searched, and years of search for future use

Search Evaluation

Red Flags

- Only 1 database searched
- Terms only for painful aspects
- The term “alternative” used alone with no other alternative terms
- Keywords listed not relevant to protocol
- Keywords and concepts linked in an incorrect manner
- Search doesn't cover adequate time period (5-10 years)

AWIC Tips for Searching for Alternatives

- General area of study
- Species being used
- Describe protocol
- Organ systems involved
- Acronyms
- Names of hormones, enzymes, CAS#, trade names, etc.
- Prominent authors in field including work published by investigator
- How is the proposed study unique
- Is the investigator aware of any possible alternatives
- Any previous searches conducted—keywords used

Searching for Alternatives

Search Strategy

Two Phases

- Phase I: Reduction and refinement- citations pertinent to PI's field of study.
- Phase II: Replacement- use of non-animal or alternative animal models.

Searching for Alternatives

Alternative Terms

Reduction and Refinement

- aduers?
- analges?
- aneshe? anashe?, anaeshe?
- monitor? device?
- restrain?, immobil?
- restrict?
- tranquiliz?
- anxiolytic
- assay?, technique?, method?
- environment? enrich?
- euthanasia
- positive reinforce?
- handling, housing, caging
- pain?, distress?
- technique?, method?, procedur?
- train?, educat?, teach?, instruct?

Replacement

- aneshe?, anashe?, anaeshe?
- animal testing alternative?
- anxiolytic
- assay?, technique?, method?
- bacteria
- cadaver?
- culture? (cell, tissue, organ)
- environment?, enrich?
- euthanasia
- fish, cephalopod?
- handling, housing, caging
- invertebrate?
- isolated (cell, tissue, organ)
- mannequin or manikin
- model?
- pain? distress?
- plastinat?
- simulate?
- software
- technique?, method?, procedur?
- train?, educat?, teach? instruct?
- video?
- virtual (surgery, reality)
- vitro (method, model, technique)

**Much of the information used in this tip sheet is compliments of AWIC.*

Databases

Biomedical and Biological

- AGRICOLA*
- CAB
- MEDLINE*
- TOXLINE*
- EMBASE*+
- BIOSIS+
- Zoological Record
- Life Sciences
- PSYCHINFO*
- ASFA
- Pascal
- SciSearch*
- Current Contents

* Available NIH-wide

+ Limited search capability available; recommend NIH Librarian Mediated Search

Pharmaceutical and Technological

- Pharmaceutical News Index
- International Pharmaceutical Abstracts
- NTIS
- INSPEC
- Compendex Plus
- Japanese Science and Technology
- Micro Software Guide
- Gale Group Computer Database

Additional Databases (Web)

- Animal Welfare information Center (AWIC) <http://www.nal.usda.gov/awic/>
- Defense Technical Information Center (DTIC) <http://www.dtic.mil/>
- DoD Biomedical Research Database <http://www.scitechweb.com/acau/brd>
- Altweb <http://altweb.jhsph.edu/>
- Norwegian Reference Centre Alternatives Database <http://oslovet.veths.no/databasesintro.html>

Contact Information for NIH Library

National Institutes of Health
10 Center Drive, MSC 1150
Building 10, Room 1L-25, Bethesda, MD 20892-1150

NIH Librarians

Phone: 301-496-1080

Email: NIHLibrary@nih.gov

URL: http://nihlibrary.nih.gov/Forms/Search_Requests.html