A bio

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Dr. Kim Wever and Dr. Carlijn Hooijmans
Recommendations on performing preclinical SRs

Kim Wever
Definitions

- **Systematic Review:**
  - The process of systematically locating, appraising and synthesizing evidence from scientific studies in order to obtain a reliable overview.

- **Meta-analysis (optional):**
  - Combination of results of individual studies in an overall statistical analysis
Benefits of preclinical SRs

- Provide overview of available evidence
- Identify knowledge gaps
- Critical appraisal of study quality
- Identify factors influencing treatment efficacy
- Inform experimental design of animal studies
Tools per SR phase

- Preclinical SR protocol format
- PROSPERO4animals
PROSPERO 4 animals

Accessing and completing the registration form

Please see our short video on how to complete the registration form

https://www.crd.york.ac.uk/PROSPERO
Tools per SR phase

• Preclinical SR protocol format
• PROSPERO4animals
• Step-by-step guide for searching
• Search filters for animal studies
A step-by-step guide to systematically identify all relevant animal studies

Abstract
Before starting a new animal experiment, thorough analysis of previously performed experiments is scientific as well as on an ethical point of view. The method that is most suitable to carry out such a systematic review (SR). An essential first step in an SR is to search and find all studies. It is important to include all available evidence in an SR to minimize bias and reduce human experimental outcomes. Despite the recent development of search filters to find animal studies in searching for all available animal studies remains a challenge. Available guidelines from the clinical directly to the situation within animal research, and although there are plenty of books and course literature, there is no compact guide available to search and find relevant animal studies. Therefore structured, thorough and transparent for animal studies both preclinical and fundamental step-by-step guide was prepared and optimized using feedback from scientists in the field of animal research. The step-by-step guide will assist scientists in performing a comprehensive literature search and, thereby, the scientific quality of the resulting review and prevent unnecessary animal use in the future.

Keywords: Search guide, systematic review, education and training


Table 1 Basic steps on how to design and carry out a comprehensive search strategy to identify potentially relevant animal studies on a specific research topic

<table>
<thead>
<tr>
<th>Step</th>
<th>Details</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Formulate research question.</td>
<td>Formulate a focused research question, consisting of:</td>
</tr>
<tr>
<td></td>
<td>(i) Intervention exposure</td>
<td>(i) Intervention exposure</td>
</tr>
<tr>
<td></td>
<td>(ii) Disease of interest/health problem</td>
<td>(ii) Disease of interest/health problem</td>
</tr>
<tr>
<td></td>
<td>(iii) Animal model</td>
<td>(iii) Animal model</td>
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<tr>
<td></td>
<td>(iv) Animal species/population studied</td>
<td>(iv) Animal species/population studied</td>
</tr>
<tr>
<td></td>
<td>(v) Outcome measures</td>
<td>(v) Outcome measures</td>
</tr>
<tr>
<td>2.</td>
<td>Identify appropriate databases and sources of studies.</td>
<td>Identify both general biomedical and topic-specific databases.</td>
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<tr>
<td></td>
<td></td>
<td>Select all relevant databases.</td>
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<td></td>
<td></td>
<td>Check other sources, such as reference lists.</td>
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<tr>
<td>3.</td>
<td>Transform research question into search strategy.</td>
<td>Design and run a search strategy customized for each database.</td>
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<td></td>
<td></td>
<td>Start with a database that includes a thesaurus, e.g. PubMed or EMBASE.</td>
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<tr>
<td></td>
<td></td>
<td>Involve an information specialist.</td>
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<td></td>
<td>Screen citations (titles/abstracts) in reference software.</td>
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<tr>
<td></td>
<td></td>
<td>Document the applied search strategies.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Publish Pubmed, n = 172; EMBASE, n = 125.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Remove duplicates (n = 139).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total number of unique citations, n = 450.</td>
</tr>
<tr>
<td>4.</td>
<td>Collect search results and remove duplicates.</td>
<td>Combine saved citations of all databases into one file in reference software and remove citations that appear more than once.</td>
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<tr>
<td></td>
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<td>Screen PubMed, n = 172; EMBASE, n = 450.</td>
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<tr>
<td></td>
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<td>Total number of unique citations, n = 450.</td>
</tr>
<tr>
<td>5.</td>
<td>Identify potentially relevant papers.</td>
<td>Screen PubMed, n = 172; EMBASE, n = 450.</td>
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<td>Total number of unique citations, n = 450.</td>
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</tbody>
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Tools per SR phase

- Preclinical SR protocol format
- PROSPERO4animals
- Step-by-step guide for searching
- Search filters for animal studies
- SyRF online screening and annotation
- SYRCLE Risk of bias tool
- Guides to preclinical meta-analysis
Guides to preclinical MA

Steps of

1. Phrase the re-
   (Note: Often ex-

2. Define the stu-
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3. Search for all
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4. Select all rele-
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5. Assess the stu-
   (Note: The ex-

6. Extract the rel-
   (Note: A spec-

7. Analyse and c-
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8. Present and ir-
   (Note: Often, a

Figure 1 Steps to b-
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HANDLE WITH CARE
Guides to preclinical MA

Meta-Analyses of Animal Studies: An Introduction of a Valuable Instrument to Further Improve Healthcare

Abstract

In research aimed at improving human health care, animal studies still play a crucial role, despite political and scientific efforts to reduce preclinical experimentation in laboratory animals. In animal studies, the results and their interpretation are not always straightforward, as no single study is executed perfectly in all steps. There are several possible sources of bias, and many animal studies are replicates of studies conducted on different species.

Clinical Neuroscience Invited review

Meta-analysis of data from animal studies: A practical guide

HIGHLIGHTS

- Meta-analysis is an invaluable tool in the life sciences.
- Methods for the analysis of preclinical data.
- Heterogeneity.

Section 11 Meta-Analysis

11.1 What is Meta-Analysis?

A meta-analysis is the statistical combination of results from two or more separate studies.

11.2 Why perform Meta-Analysis?

Meta-analyses are performed for a variety of reasons.
Tools per SR phase

- Preclinical SR protocol format
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- Step-by-step guide for searching
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- SyRF online screening and annotation
- SYRCLE Risk of bias tool
- Guides to preclinical meta-analysis
- Preclinical GRADE
- CAMARADES Berlin SR Wiki
- Preclinical SR database
- ... and more!

Also accessible through the Radboudumc meta-research team or CAMARADES websites
Let’s do get help
Educational resources

• **SYRCLE’s E-learning** on systematic reviews of animal studies
• **EQIPD E-learning course** on rigour and robustness of animal research
• One-day and two-day **workshops** by CAMARADES Netherlands or Berlin
• **Weekly consultation sessions** by CAMARADES Berlin
• **Personal coaching** (funded by ZonMW for researchers in NL)
Enjoy!