Neonatal Fellows Academic Research Day

Database Searching and Systematic Review Methods

HELEN BROWN, WOODWARD LIBRARY
RESEARCH HELP

Helen L. Brown
  helen.l.brown@ubc.ca | 604-822-4442

Virtual Consultations Hours
  Wednesdays from 12:00-2:00pm, Jan 24; Feb 7 – April 25.
  Go to http://meet.vc.ubc.ca | meeting ID: 82838.
  For more login options and help setting up go here.

Woodward Library Reference Desk
  Mon.- Fri. 9-5 , Sat. 1-4
  wd.ref@ubc.ca | 604-822-4440

AskAway – Chat with librarians from across BC
  Library homepage → Ask Us!
## TODAY'S SCHEDULE – ESTIMATED TIMING

<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:30 – 8:50</td>
<td>Introductions &amp; Overview of Systematic Review</td>
</tr>
<tr>
<td>8:50 – 9:35</td>
<td>How to Structure a Search Strategy</td>
</tr>
<tr>
<td>10:35 – 11:20</td>
<td>Searching in Ovid MEDLINE &amp; PubMed</td>
</tr>
<tr>
<td>11:20 – 11:35</td>
<td>Other Databases</td>
</tr>
<tr>
<td>11:35 – 11:45</td>
<td>Grey Literature</td>
</tr>
<tr>
<td>11:45 – 11:55</td>
<td>Preparing for Publication of a Systematic Review</td>
</tr>
<tr>
<td>11:55 – 11:30</td>
<td>Questions</td>
</tr>
</tbody>
</table>
OBJECTIVES

1. Describe the stages in a Systematic Review

2. Be aware of Guidelines for creating a Systematic Review

3. Develop a question suitable for a thorough search of the literature

4. Know which sources to choose

5. Acquire skills to conduct a structured and replicable search strategy

6. Gain tips on how to manage a complex search and/or systematic review
SYSTEMATIC REVIEW DEFINITION

"A Systematic Review attempts to identify, appraise and synthesize all the empirical evidence that meets pre-specified eligibility criteria to answer a given research question.

Researchers conducting Systematic Reviews use explicit methods aimed at minimizing bias, in order to produce more reliable findings that can be used to inform decision making."

Cochrane Handbook for Systematic Reviews of Interventions: http://handbook.cochrane.org
HOW ARE SYSTEMATIC REVIEWS DIFFERENT FROM OTHER REVIEWS?

High quality systematic reviews seek to:

• Identify all relevant published and unpublished evidence
• Select studies or reports for inclusion
• Assess the quality of each study or report
• Synthesize the findings from individual studies or reports in an unbiased way
• Interpret the findings and present a balanced and impartial summary of the findings with due consideration of any flaws in the evidence.

• Because a systematic review synthesizes evidence (often from randomized controlled trials), there needs to be a critical mass of evidence to draw from. A **scoping review** is better when there is little existing research.

• Systematic reviews can take months. **Rapid review** is an emerging methodology which aims for quicker answers. Downside: less rigorous.

• A **meta-analysis** is a systematic review which goes one step further and pools and analyzes data from included studies.
SYSTEMATIC REVIEW PROCESS

Stage 1: Planning the Review
Step 1 – Forming a review panel
Step 2 – Mapping the field of study
Step 3 – Producing a review protocol

Stage 2: Identifying and evaluating studies
Step 4 – Conducting a systematic search
Step 5 – Evaluating studies

Stage 3: Extracting and synthesizing data
Step 6 – Conducting data extraction
Step 7 – Conducting data synthesis

Stage 4: Reporting
Step 8 – Reporting the findings

Stage 5: Utilizing the findings
Step 9 – Informing research
Step 10 – Informing practice
HOW TO STRUCTURE A SEARCH STRATEGY
Mapping the field of study – defining the question

An answerable question is important to:

• Inform a **decision** based on the answer
• Clarify inclusion/exclusion parameters
• Develop a well-constructed, efficient yet comprehensive, search
Conceptual frameworks help

- Clarify the search topic
- Identify the main **concepts**
- Develop a range of possible search terms for each concept
- Build a search strategy based on the possible search terms

One framework is PICO

Others: SPICE, PESICO, SPIDER, ECLIPSE, etc.
PICO FRAMEWORK

Patient / Problem / Population

Intervention / Item of interest

Comparison

Outcome
Does donor milk supplementation improve outcomes for preterm infants?
EXAMPLE AS PICO

P: preterm infants

I: donor milk supplementation

C: no supplementation, supplementing with formula

O: more specific? – mortality, intestinal disorders, duration of breastfeeding, later feeding behaviours, gut bacteria, etc.
Research question =
Among P does I (versus C) affect O?
Or
Among preterm infants, does supplementing with donor milk improve hospitalization rates?
FORMULATING A SEARCH – PICO ALTERNATIVE

It is usually unnecessary, and even undesirable, to search on every aspect of the review’s clinical question (often referred to as PICO).

Instead, concentrate on the following:

(1) Terms to search for the health condition of interest, i.e. the population.
(2) Terms to search for the intervention(s) evaluated.
(3) Terms to search for the types of study design to be included.

http://handbook.cochrane.org/
ACTIVITY – 5 MINUTES

What is YOUR question?

Use the formulating the Answerable Question/Planning the Search Strategy – PICO worksheet to identify the different elements of your question
SEARCHING FOR YOUR TOPIC
A nice way to get started on your search is to find out if a SR has been done on your topic before!

- Clinical queries in PubMed
- Cochrane Database of Systematic Reviews
- Prospero [http://www.crd.York.ac.uk/PROSPERO](http://www.crd.York.ac.uk/PROSPERO)
- Database search with publication type limit “Review” or “systematic review”
- Google Scholar limit to intitle:systematic review or via Advanced Search screen
ACTIVITY: IS THERE A SR ON YOUR TOPIC? – 5 MINUTES

Go to Pubmed Clinical Queries
1. Use UBC Library Indexes and Databases
2. Go to Pubmed
3. Click on Clinical Queries
4. Type in 2 of your PICO search concepts
5. Check the Systematic Review column

Go to Google Scholar
1. Use UBC Library Indexes and Databases
2. Type allintitle: systematic review

Go to Prospero: http://www.crd.York.ac.uk/PROSPERO
MEDLINE: PUBMED AND MEDLINE

PUBMED

- Some in-process citations
- Some older and non-medical material
- Some eBooks

MEDLINE

Articles which have been processed (indexed)
Have MeSH
# MeSH vs. Keywords

<table>
<thead>
<tr>
<th>MeSH/Subject Headings</th>
<th>Keywords</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Time delay: Established concepts (Diabetes, Heart Disease)</td>
<td>• Newer concepts (eHealth)</td>
</tr>
<tr>
<td>• Conservative Bias: Core biomedical concepts (diseases, drugs &amp; chemicals, anatomy)</td>
<td>• Boundary-crossing topics (psychosocial and humanities concepts)</td>
</tr>
<tr>
<td>• Traditional parts of medicine (Surgery, Immunology)</td>
<td>• New parts of medicine (Rehabilitative Sciences, Population and Public Health, etc.)</td>
</tr>
</tbody>
</table>

*For sensitive searches use a combination of MeSH and keywords*
Tools for Keywords

Phrases: Find a specific phrase (more specific)
- “cultural deprivation”

Proximity: Find words within a X words of each other (more flexible, increases the number of results)
- needle ADJ2 exchange
- Proximity searching is not available in every interface, see help

Truncation: Find alternative word endings
- $ OR * in OvidSP databases will search for multiple word endings
- needle* – will search for needle or needles etc

Wildcards: Find alternative spellings (replaces 0 or 1 character)
- Colo？r
Limits

- Population: Age, Gender, Ethnicity
- Publication: Language, Date, Type, Study Type
- Always apply limits last
- Limits may exclude relevant articles, such as the newest studies. When doing systematic reviews speak to a librarian.

Aspects of Population, Design and Publication Type
Review: Search Process

1. Breakdown of question into component concepts (PICO)
2. Choice of terms/subject headings that find articles on each concept
3. Combing those terms/headings using BOOLEAN
4. Application of limits/filters to restrict to date, study design
5. Adaptation of search strategy to different databases (changes to syntax, subject headings)

Creating a search strategy is an iterative process that requires exploration and playing
Saving Search History

Save Medline search as permanent
Set up AutoAlert for new material

For Systematic reviews:
• Ovid is a good place to start as it allows you to EDIT your search during the initial iterative process
• Adapt search for Embase
• Adapt search logic for other databases in other interfaces
DOING A BETTER SEARCH

Things to think about:
• Subject headings/controlled vocabulary
• Alternate spellings – analyze/analyse, fetus/foetus
• Alternate endings – learner/learns/learning
• Synonyms – doctor/physician/clinician
• Trade names/generics – iClicker/audience response system
• Acronyms – task-based learning or TBL
• Antonyms – success/failure, increase/decrease
• Homonyms – same word – different meanings –
  • Patient educators (patients who educate doctors)
  • Patient educators (people who educate patients)
Another example…In undergraduate medical education, does the use of clicker technology in the classroom improve learning outcomes?

Use **OR** to create a large set of synonyms

Use **AND** to find articles containing all three of your concepts

Use **NOT** to remove a known undesired concept or set

**OR** = More (doctors OR physicians OR residents)

**AND** = Less (clickers AND learning)

**NOT** = Less (clickers NOT bedside) (Set 1 NOT Set 2)
Improved Educational Outcomes
OR
Learning Outcomes

Audience response systems
OR
Clickers
AND
Electronic voting systems

Health professionals
OR
Medical students

Set 1

Set 2

Set 3

OR = More (clickers OR electronic voting systems)
AND = Less (clickers AND learning outcomes)

TYPES OF RESOURCES USED IN SYSTEMATIC REVIEWS
WHAT KINDS OF RESOURCES MUST BE SEARCHED FOR A SYSTEMATIC REVIEW?

It’s **essential** to search more than one database for a systematic review! Other resources for the published biomedical literature include: [wiki.ubc.ca/Library:Health_and_Biomedical_Databases](wiki.ubc.ca/Library:Health_and_Biomedical_Databases)

Also see the research guide for your subject: [guides.library.ubc.ca](guides.library.ubc.ca)

- Systematic review and Clinical Trial Databases
- PROSPERO
- Standard bibliographic databases
- Grey literature (Google), conference proceedings, theses
- Citation lists from the most relevant articles
- Publication lists for the most important authors in the field
- Conversations with experts in the field
It’s important to search for unpublished literature to help overcome publication bias.

Sources and techniques for expanding your search beyond the published literature are linked from this guide: 
[guides.library.ubc.ca/systematicreviewsearch](http://guides.library.ubc.ca/systematicreviewsearch)
Use the “Locating studies” tab
ACTIVITY: OTHER DATABASES & GREY LITERATURE – 10 MINS

1. Locate one additional licensed database and one grey literature source for your topic

2. Do a search in each for your question.
PART 5: PREPARING FOR PUBLICATION
STAGE 4: REPORTING & MANAGING THE PROCESS

• Cochrane Handbook – Chapter 6 Searching for Studies

• PRISMA – Flow chart & checklist

• Centre for Reviews and Dissemination (CRD)’s Guidance for Undertaking Reviews in Health Care
  • Appendix 2 for search strategy examples
  • Appendix 3 for documenting the search
PRISMA

Preferred reporting of items for systematic reviews and meta-analyses
Search methods for identification of studies

Electronic searches

We searched the following electronic databases:
Cochrane Central Register of Controlled Trials (CENTRAL) (The Cochrane Library).
Searched 18 February 2011.
LILACS. Searched 21 February 2011.
POPLINE. Searched 21 February 2011.
Science Citation Index (1970 to 19 February 2011). Searched 21 February 2011.
metaRegister of Clinical Trials. Searched 23 February 2011.
The search strategies for each database are in Appendix 1.
We did not apply any data or language restrictions, and no translation of relevant data was necessary.
• **Searching other resources**
  
  We searched through the bibliographies of included studies and asked authors of included studies for lists of other studies that should be considered for inclusion. For assistance in identifying ongoing or unpublished studies, on 25 January 2011, we contacted the Sprinkles Global Health Initiatives, the Home Fortification Technical Advisory Group, the nutrition section of the United Nations Children’s Fund (UNICEF), the World Food Programme (WFP), the Micronutrient Initiative (MI), the Global Alliance for Improved Nutrition (GAIN), Helen Keller International (HKI), Sight and Life Foundation, the Departments of Nutrition for Health and Development from the World Health Organization (WHO) and the U.S. Centres for Disease Control and Prevention (CDC).

• The International Clinical Trials Registry Platform (ICTRP) was also searched for any ongoing or planned trials (24 January 2011). We did not apply any language restrictions.
OTHER TIPS FOR MANAGING THE PROCESS

- Use a **table created in Word** to keep track of search terms and databases you’ve tried, and when.
- Most databases allow you to **save search history** and set up **alerts** for when studies matching your strategy are added to the database.
- Use **Refworks, EndNote**, or other citation management software to store, organize, and deduplicate results.

*Watch for workshops on citation management tools*
OTHER PLANNING CONSIDERATIONS

Time: may be considerable. One reported range was 216-2518 hours.*

Team: ideally at least 2 people are involved in order to reduce bias.

Costs: may include funds for services like ECRS (Enhanced Consultation Research Service); statistical software; travel funds or other resources for knowledge translation activities which may be required by granting agency.

LIBRARIAN SUPPORT FOR SYSTEMATIC REVIEW SEARCHING

UBC Librarians are available to assist with systematic review searches:

• For review of search strategies
• As team members (as required by some granting agencies)
• As authors of the methodology section
UPCOMING WORKSHOPS

Searching PubMed & Medline (Ovid)
Jan 30, 10-11:30am | BCCHRI

Health Databases
Feb 13, 2-3:30pm | BCCHRI

Scholarly Publishing & Assessing Your Impact
Mar 6, 2-3:30pm | BCCHRI

Author Rights, Funding Mandates and Open Access Publishing
Mar 22, 10-11am | BCCHRI

EndNote
Upcoming, likely in March and April
UPCOMING WORKSHOPS

Full listings – [https://events.library.ubc.ca/](https://events.library.ubc.ca/)

**SPSS Part 2: Data Management and Bivariate Analysis**
Jan 24, 10-12pm | Koerner Building

**Best Practices in Research Data Management**
Jan 24, 2-3:30pm | Koerner Building

**Pixelating: A Digital Humanities Mixer - Surveying the Landscape: Research Data Management, Data Governance and Ethics (webcast)**
Jan 25, 1-3pm | Koerner Building

**NVivo (Part 1) for Mac - Getting Started with NVivo**
Jan 30, 10-12pm | Koerner Building

**Graduate Student Writing Community**
Jan 30, 2-4pm | Koerner Building

**Tri-Agency Open Access Policy: Requirements and Routes to Compliance**
Jan 31, 12:30-1:15pm | Koerner Building
QUESTIONS?

helen.l.brown@ubc.ca