Introduction to Systematic Reviews
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CFRI Workshop
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## KNOW IT ALL
### Literature Searching Workshop Series

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Today’s workshop is an introduction…..

Within the context of the SR process we will focus on 3 elements:

1. Defining the question
2. Locating studies
   via licensed databases
   via other information sources
3. Managing the process
What is a Systematic Review?

"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."

Source: Cochrane Handbook for Systematic Reviews of Interventions: http://handbook.cochrane.org
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 synthesising data**
- Step 6 – Conducting data extraction
- Step 7 – Conducting data synthesis

**Stage 4: Reporting**
- Step 8 – Reporting the findings

**Stage 5: Utilising the findings**
- Step 9 – Informing research
- Step 10 – Informing practice
How to prepare for a Systematic Review

- What is the question?
- Has one been done before?
- Other considerations:
  - Who is on the team?
  - What to budget?
  - What are the timelines?
Stage 1: Planning

Step 2: 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

Most often used framework is PICO

Others: SPICE, PESICO, SPIDER, ECLIPSE ...
PICO framework

Patient / Problem / Population

Intervention / Item of interest

Comparison

Outcome

(Richardson et al., 1995)
Example

Would the use of commercial video game systems such as Xbox Kinect and Nintendo Wii improve balance outcomes and enjoyment in aged patients undergoing rehabilitation for stroke?
Example “translated”

P: aged patients undergoing rehabilitation for stroke
I: systems like Xbox Kinect or Nintendo Wii
C: traditional rehabilitation techniques
O: improved balance and enjoyment
PICO QUESTION refined

Formula: Among [P] does [I] instead of [C] affect [O]? Does the use of exergaming tools, such as Xbox, as opposed to traditional rehabilitation, improve balance in the aged with stroke?

OR

 Among the aged with stroke does exergaming improve balance?
Activity

What is your question?

Use the Formulating the Answerable Question/Planning the Search Strategy – PICO worksheet to identify the different elements of your question for your topic.
### Systematic Review Process

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**Stage 1: PLANNING**

Is a systematic review the right methodology?

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**Systematic Reviews**
Other common knowledge synthesis methods

• 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.
Stage 1: PLANNING

Has an SR on your topic been done 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 “systematic review” in title via Advanced Search or allintitle: command
Activity

Is there a Systematic Review on your topic?

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/
Step 4: Conducting a systematic search

Sources of studies: Gold Standard

A. Licensed Databases
B. Grey Literature
C. Hand searching
D. Reference chasing
E. Contact with Researchers

a. Medline, Embase, CINAHL etc.
b. Dissertations, conference proceedings, government reports etc.
c. Review contents pages of key journals in subject area
d. Follow up on reference lists and see who has cited important papers
e. Contact experts for background information on non-published research
Stage 4: Conducting a systematic search

Other sources to search

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)
How to critique a Systematic Review

• Description of methodology
  – Database names and date ranges
  – Search strategy present
  – Process described

• Effort to ameliorate bias?
  – Sufficient databases used
  – Search strategy replicable
  – Alternate sources used

• Use of checklists for other elements
Unpublished literature

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

Use the “Locating studies” tab
Activity: Other databases and grey literature

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

2. Do a search in your grey literature source for your question.
Stage 4: Reporting - Managing the process

- Cochrane Handbook - Chapter 6 Searching for Studies
- Centre for Reviews and Dissemination (CRD). Guidance for Undertaking Reviews in Health care
  - Appendix 2 for Search strategy examples
  - Appendix 3 for Documenting the search (Handout)
- PRISMA – Flow chart and checklist
PRISMA
Preferred Reporting of Items for Systematic reviews and Meta Analyses

Records identified through database searching
(n =   )

Additional records identified through other sources
(n =   )

Records after duplicates removed
(n =   )

Records screened
(n =   )

Records excluded
(n =   )

Full-text articles assessed for eligibility
(n =   )

Full-text articles excluded, with reasons
(n =   )

Studies included in qualitative synthesis
(n =   )

Studies included in quantitative synthesis (meta-analysis)
(n =   )
Other tips for managing the process:

• **Create a table in Word** to keep track of search terms and databases you’ve tried, and when.
• **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 during screening.

**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.

Resources for later reference

• Search methodology
  guides.library.ubc.ca/systematicreviews

• Searching techniques – Database tutorials
  Medline Ovid and CINAHL

• Subject support
  Subject librarians and Research guides