

So, You Think You Want To Do Systematic Reviews

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Distinctions & Definitions

- Literature Review OR Narrative Review

1. The process of reading, analyzing, evaluating, and summarizing scholarly materials about a specific. The results may be compiled in a report or may serve as part of a research article, thesis, or grant proposal. (Fink, 2009)

2. A literature review is a text of a scholarly paper, which includes the current knowledge including substantive findings, as well as theoretical and methodological contributions to a particular topic. (Baglione, 2012)

3. Informal and subjective methods used to collect and interpret information for a broad perspective on a topic with up-to-date information.



Distinctions & Definitions

- Meta-Analysis

1. Meta-analysis use of statistical techniques in a **systematic review** to integrate the results of included studies. Sometimes misused as a synonym for systematic reviews, where the review includes a meta-analysis (Cochrane Community Reviews Glossary, 2015)
2. A quantitative statistical analysis of several separate but similar experiments or studies in order to test the pooled data for statistical significance (Webster, 2014)
3. Meta-analysis is a quantitative, formal, epidemiological study design used to systematically assess previous research studies to derive conclusions about that body of research. Outcomes from a meta-analysis may include a more precise estimate of the effect of treatment or risk factor for disease, or other outcomes, than any individual study contributing to the pooled analysis (Haidich, 2010)

Distinctions & Definitions

- Systematic review

1. A properly conducted systematic review (SR) faithfully summarizes the evidence from **all** relevant studies on the topic of interest, and it does so concisely and transparently (Cook, 1997)
2. SRs involve searching and analyzing all available evidence in a **systematic** and **transparent** fashion (Reeves, 2002)
3. Many systematic review include meta-analyses, but it is not necessary.



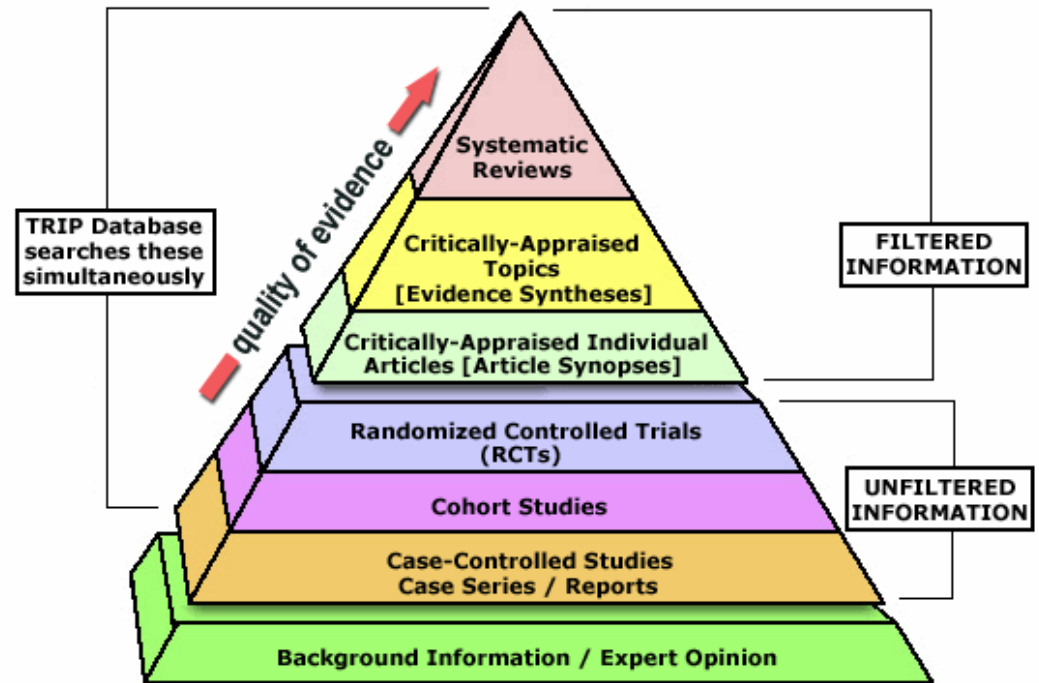
Why It's Done

- Evidence Based Medicine OR Evidence Based Practice
- EBM is the integration of **best research evidence** with clinical expertise and patient values (Sackett, 2000)
- Guide clinical decisions
- Save clinicians valuable time
- Provide objective evidence appraisal
- Can resolve contradictions in the literature
- May identify the need for additional research or determine where research is lacking and can also prevent unnecessary studies from being carried out



Finding the Best Evidence

- Systematic reviews of RCTs are considered the highest level of evidence; depending on the research question



Finding the Best Evidence

- Important to note that systematic reviews (SRs) are not just of RCTs; they can be also include other study designs including
 - Controlled trial (not randomized)
 - Prospective cohort
 - Case series
 - Case control



Steps to Conduct A Review

1. Develop a research question (PICO may help formulate)
2. Define inclusion and exclusion criteria
3. Conduct a comprehensive literature search
4. Locate studies
5. Select studies
6. Assess study quality
7. Extract data
8. Analyze and present results
9. Interpret results
10. Update the review as needed

Comprehensive Literature Search

- Conduct a preliminary search to determine if a systematic review has already been conducted on the topic
- To reduce bias multiple databases must be searched
- Each database should be searched with a database specific strategy
- Strategies are often very involved



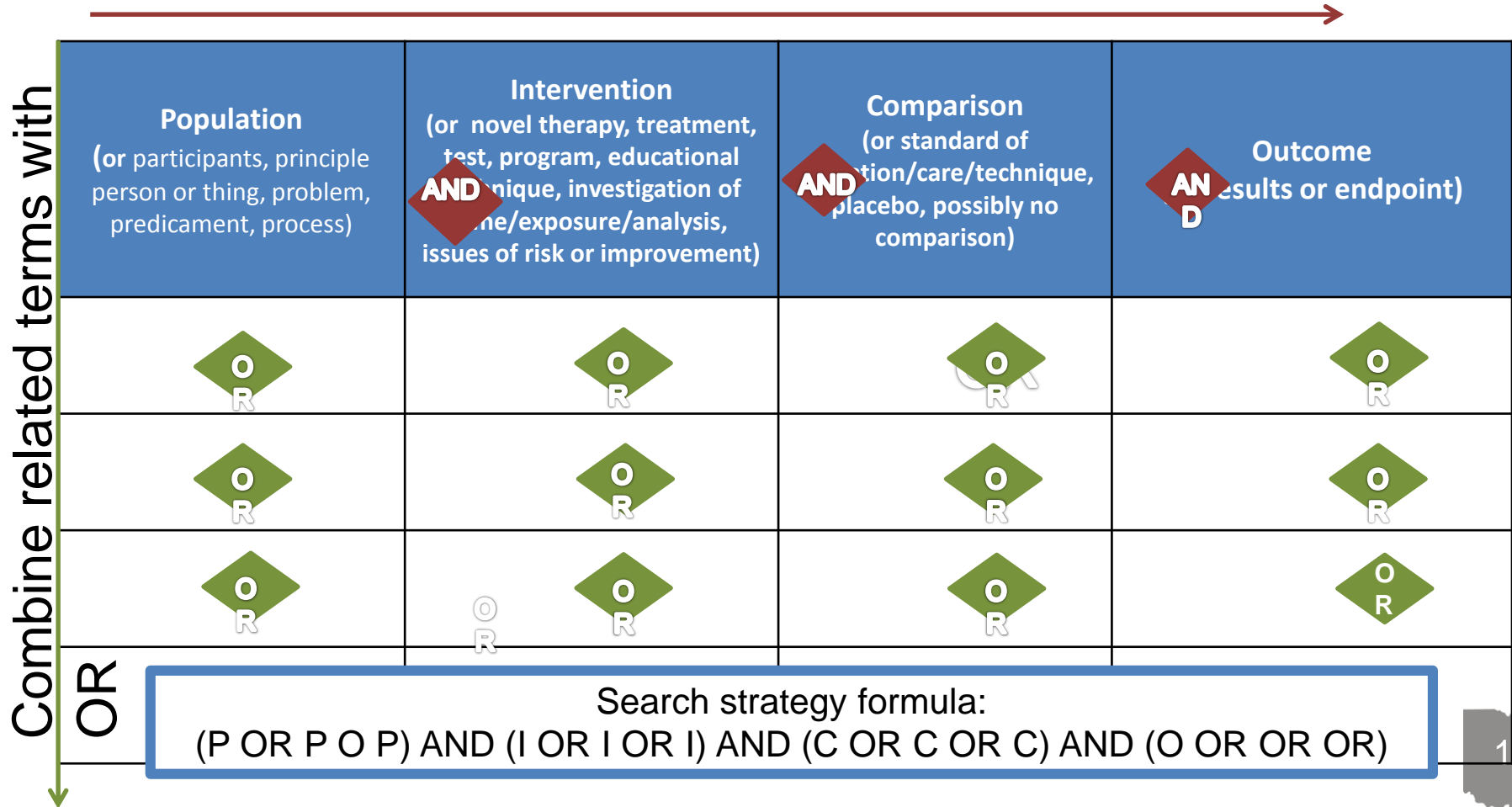
Formulate Strategy – PICO model

- Patient/Population
- Intervention
- Comparison
- Outcome



Health Sciences Library

Combine individual concepts with AND



Building the Strategy - Tips

- Use the PICO to help formulate
- Is the search narrow? Broaden
Broaden by selecting synonyms and OR them together
Broaden the concept (ex. Smoking → Tobacco Use, Tobacco Smoke Pollution)
- Is the search too broad? Narrow
The more terms that are combined with AND, the smaller the retrieval
- Look at MeSH terms/keywords from key studies

Example of Complicated Strategy

- Search (((((((("Critical Illness"[Mesh] OR "Critical Care"[Mesh]) OR "Intensive Care Units"[Mesh]) OR "Sepsis"[Mesh]) OR "Respiratory Distress Syndrome, Adult"[Mesh]) OR "Multiple Organ Failure"[Mesh]) OR "Respiration, Artificial"[Mesh]) OR "Critical Illness"[Mesh]) OR "Ventilator Weaning"[Mesh]) OR (critical illness[tiab] OR critically ill[tiab] OR criticall*[tiab] OR critical care[tiab] OR intensive care[tiab] OR icu[tiab] OR sepsis[tiab] OR septic[tiab] OR systemic inflammatory response[tiab] OR acute respiratory distress[tiab] OR ards[tiab] OR acute lung injury[tiab] OR multiple organ failure[tiab] OR mechanical ventilation[tiab] OR ventilator wean*[tiab])) AND and AND (((("Neuromuscular Diseases"[Mesh] OR "Muscular Diseases"[Mesh]) OR "Paresis"[Mesh]) OR (neuromuscular d*[tiab] OR muscular d*[tiab] OR paresis[tiab] OR polyneuropath*[tiab] OR neuromusc*[tiab] OR myopath*[tiab] OR neuropath*[tiab] OR neuromyopath*[tiab]))) NOT (((("Neuromuscular Diseases/diagnosis"[Mesh] OR "Neuromuscular Diseases/radiography"[Mesh] OR "Neuromuscular Diseases/radionuclide imaging"[Mesh] OR "Neuromuscular Diseases/ultrasonography"[Mesh]) OR ("Neurologic Manifestations"[Mesh])) AND and AND (((((((("Intensive Care Units"[Mesh] OR "Critical Care"[Mesh]) OR "Respiratory Distress Syndrome, Adult"[Mesh]) OR "Multiple Organ Failure"[Mesh]) OR "Systemic Inflammatory Response Syndrome"[Mesh]) OR "Respiration, Artificial"[Mesh]) OR "Acute Lung Injury"[Mesh]) OR "Ventilator Weaning"[Mesh]) OR "Critical Illness"[Mesh]))



Results from Literature Search

- **Previous Slide - Literature Review Schematic**
- Electronic Database Literature Search

CENTRAL, CINAHL, EMBASE, EBSCO, MEDLINE

- *Total citations = 26,707*

Combined Iterative Search

- *Total citations = 419*



Detailed Breakdown

- Full Article Retrieved for Detailed Review
- *Total citations = 113*
- Met Eligibility Criteria
- *Total citations = 31*
- Did not meet eligibility criteria:
- No reproducible methods (53)
- Duplicate publication (6)
- Not adults (1)
- Unclear diagnostic tests (9)
- Case report or case series (n<3) (12)
- Hebrew language, not translated to English (1)
- *Total articles = 29*
- Excluded by review of abstract
- *Total articles = 306*
- Excluded by review of title and duplicates removed
- *Total articles = 26,288*

Ways to search the literature

- Electronic Databases
- Hand searching
- Grey Literature



Searching Electronic Databases

- PubMed searching should include a combination of MeSH (Medical Subject Heading and textwords
- Try to use the same textwords throughout the other databases
- This may not always work because what works in one database may not work in other ones
- Initially don't use limits (years, language, etc.)

Selecting Databases

- Top Resources on hsl.osu.edu
 - a. PubMed
 - b. Cochrane
 - c. Web of Science
 - d. Scopus
- Health Sciences Databases/All OSU Databases
 - a. Look at subjects covered
 - b. Consider Global Health (CAB database), Education, Psychology, etc.

Methods section on Literature Search

- Strategies must be saved
- Dates that databases were searched must be noted
- Years covered
- Brief one sentence description of databases utilized

HSL Resources Available

- Databases
- Full Text Articles
- Citation Managers
- Document Delivery for journals that are not owned at OSU
- hsl.osu.edu

Things to consider

- Length of Time
- Number of Team Members
- Citation Manager
- Tools to extract data (Elamin, 2009)

Tools and Resources

- Cochrane Handbook for Systematic Reviews of Interventions <http://handbook.cochrane.org/>
- PRISMA <http://www.prisma-statement.org/>
 1. Checklist
 2. Flow Diagram
- IOM (Institute of Medicine) Standards <http://www.iom.edu/Reports/2011/Finding-What-Works-in-Health-Care-Standards-for-Systematic-Reviews/Standards.aspx>

Software for Data Management

- **[GRADEpro](#)** (GRADE profiler) The software used to create Summary of Findings (SoF) tables in Cochrane systematic reviews. [Discuss in the forum.](#)
- Price: Free
- **[DistillerSR](#)**
- Online application designed for screening and data extraction phases of systematic reviews. [Discuss in the forum.](#)
- Price: \$30/month [for Cochrane authors.](#)
- **[EPPI-Reviewer](#)**
- Web-based software that manages references, stores PDF files and facilitates qualitative and quantitative analyses.
- Price: £10/month/user, £35/month/review.
- **[EROS \(Early Review Organising Software\)](#)**
- Web-based software designed specifically to perform the first stages of a systematic review. [Discuss in the forums.](#)
- Price: Free.
- **[Covidence](#)**
- Perform quality assessment, data extraction and final decisions to include and exclude studies online in real-time. Formerly known as ReGroup. [Discuss in the forums.](#)
- Price: Free for one review, unlimited use is \$20/month.
- **[SRDR \(Systematic Review Data Repository\)](#)**
- Web-based tool for the extraction and management of data for systematic review or meta-analysis. It is also an open and searchable archive of systematic reviews and their data.
- Price: Free.



Additional Information

- Duke University Medical Center Library
<http://guides.mclibrary.duke.edu/sysreview>
- Reeves S, Koppel I, Barr H, Freeth D, Hammick M. Twelve tips for undertaking a systematic review. Med Teach. 2002 Jul;24(4):358-63. PubMed PMID: 12193315.

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For More Information

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- Consulting with search strategies, database selection, citation manager



Questions???

