EFFECTIVE MEDICAL LITERATURE SEARCHING

DATA EXTRACTION

QUALITY ASSESSMENT

Objectives

1. Formulate your question
2. Understand basic database structure
3. Use of Boolean Logic
4. Use Field Searching
5. Use of Controlled Vocabulary
6. Specialty techniques (truncation, etc.)
7. Building your search strategy

Asking the Question: PICO

- ▫ Patient, Population or Problem
  - ▪ What are the characteristics of the patient or population?
  - ▪ What is the condition or disease you are interested in?
- ▫ Intervention or exposure
  - ▪ What do you want to do with this patient (e.g. treat, diagnose, observe)?
- ▫ Comparison
  - ▪ What is the alternative to the intervention (e.g. placebo, different drug, surgery)?
- ▫ Outcome
  - ▪ What are the relevant outcomes (e.g. morbidity, death, complications)?

http://healthlinks.washington.edu/ebp/pico.html

Creating a Boolean Search

QUESTION: Is Vitamin C helpful in treating the flu?

1. Identify concepts and list terms

Concept 1 Influenza	Concept 2 Vitamin C	Concept 3 Treatment	Concept 4 helpfulness
Influenza	Vitamin C	Treatment	Outcome
Flu	Ascorbic acid	Therapy	Recovery
	Orange Juice	Management	Success

Step 2

2. Make your OR statements, one per concept

- ◻ (influenza OR flu OR orthomyxovirus)
- ◻ (vitamin C OR ascorbic acid OR ascorbate)
- ◻ (treatment OR therapy OR management)
- ◻ (outcome OR recovery OR success)

Steps 3 and 4

3. Put "AND" between each of the OR statements

(influenza OR flu) AND (vitamin C OR ascorbic acid OR orange juice) AND (treatment OR therapy OR management) AND (outcome OR recovery OR success)

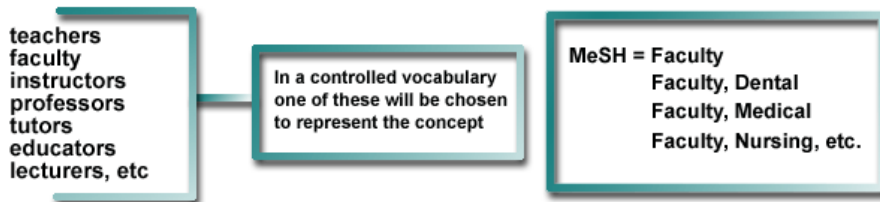4. Consider any NOT statements you might want to add.

Note: NOT isn't used very often

Controlled Vocabulary

A controlled vocabulary is a set of established terms where

☐ every term represents a single concept

☐ only one term is used for that concept

Example: Many words can be used to represent the concept "people who teach."

teachers
faculty
instructors
professors
tutors
educators
lecturers, etc

In a controlled vocabulary one of these will be chosen to represent the concept

MeSH = Faculty
        Faculty, Dental
        Faculty, Medical
        Faculty, Nursing, etc.

Another example

☐ How many words could you think of for the idea of "cancer"?
- Cancer, tumor, malignancy, neoplasm, sarcoma…

☐ Articles in a database
- Article one: "Breast tumors in young women"
- Article two: "Surgery for prostrate cancer."
- Article three: "Diagnosing Melanoma."

All three articles are about types of cancer but different terms are used in titles.

In a controlled vocabulary ONE word (*i.e.*, cancer) is chosen and placed in a special field, usually called a subject field.

For all three articles
- Article one: "Breast tumors in young women"
- Article two: "Surgery for prostrate cancer."
- Article three: "Diagnosing Melanoma."

The subject term (concept term) "cancer" is placed in the subject field by database indexers.

Now, Searching the database for cancer in the subject field will identify all records about the concept of cancer even if a different word for cancer is used.

- Search 'cancer-in-subject-field' finds all three articles
- How many articles would the search 'cancer-in-title-field' find?

Subject vs. Keyword Searching

Controlled vocabulary searching

- Matches terms against a specific field in the record.
- You need to consult a thesaurus (paper or online) to find out what the controlled vocabulary term is for each concept.

Free-text (keyword) searching

- Some concepts have many synonyms. A free-text search statement would mean "OR"ing all those terms together
- Matches terms against words anywhere in record (abstract, title, etc.).

Truncation

What about including the singular and plural versions of words as well as other word variations?

For example: **therapy, therapies, therapeutics,**

You could combine them all in an OR relationship:
(therapy OR therapies OR therapeutics OR therapeutic)

But an easier way is by the use of truncation.
therap*

Each database handles truncation in a unique way.
The '*' and '$' are the most common wildcard symbols.

Step-By-Step Search Construction

1. State the question
2. Identify the concepts in the question
3. For each concept, determine keywords and subject terms
4. Specify field tags after terms if needed
5. Combine terms for the same concept with "OR" in parenthesis
6. Combine "OR" statements with AND
7. Put any NOT terms at the end

Keep track of your searches, how many articles were found total, and how many you selected as relevant

Major Bibliographic Databases

Major bibliographic databases for RCTs and observational studies:
- MEDLINE/PubMED (www.ncbi.nlm.nih.gov/sites/entrez?)
- EMBASE (www.embase.com)
- Cochrane Central Register of Controlled Trials (CENTRAL)
(www.thecochranelibrary.com)
- National and regional databases (often local language)
 LILACS (http://lilacs.bvsalud.org)
- Subject-specific databases
 CINAHL
(http://www.ebscohost.com/academic/
cinahl-plus-with-full-text/)
 PsychINFO
(http://www.apa.org/pubs/databases/
psycinfo/index.aspx)
! OTSeeker (www.otseeker.com)

Other Bibliographic Databases to Consider

Citation databases
- Web of Science (www.thomsonreuters.com)
- Scopus (www.scopus.com)

Dissertations, thesis databases
- ProQuest (www.Proquest.com)

Gray literature databases
- Opengrey (www.opengrey.eu) (formerly System for
Information on Grey Literature in Europe, or SIGLE)