Searching the Literature: Concepts, Resources & Searching Skills

Victoria H. Goode, MLIS
Clinical Informationist
Welch Medical Library
vgoode1@jhmi.edu
Today’s agenda

• The Steps to Searching
• Important Database features
• Why Controlled Vocabulary is Important
• Controlled vocabulary searching in PubMed
• PubMed searching techniques and mechanics
• Reminders and final thoughts
Effective Literature Searching: the steps

1. Identify your topic (and write it down!)
2. Identify applicable resources
3. Create a list of controlled vocabulary terms, synonyms and related terms
4. Conduct your search
5. Record your findings
6. Critically evaluate the information
Literature Searching Overview

• **Define the purpose** of your search

• **Form your question**
  • Write it down!

• **Now identify relevant databases and resources**

• **Create a search query** from your question – for use within a *specific* database!
  • Identify the key concepts (*often 2-3 sometimes more*) in your question
  • Find searchable terms for those concepts: most specific controlled vocabulary terms as well as keyword phrases
  • Group into distinct sets the terms that represent/describe each main concept with Boolean “OR”
  • Combine sets with Boolean “AND”
Searching Overview Cont.

- Run your search query
- Revise the query until you are satisfied
  - Remember, a **good** search query usually incorporates controlled vocabulary terms from the database along with keywords/phrases.
- Record and store your findings
  - Strategies can be saved in MyNCBI & in Word Documents – good for making notes to self; citations can be saved in RefWorks or other citation management programs.
- Revisit/revise the search query for each distinct database you search
- Evaluate the findings and critically appraise the articles
What’s the big deal with controlled vocabulary?

- It provides a consistent, precise way to retrieve information when different natural language words/phrases (synonyms) are used for the same concept, or when the same natural language is used for different concepts! (e.g. “cold” Which meaning?)
- Controlled vocabulary terms control for spelling variations (think Brit v. Am. Eng.), plurals, acronyms.
- Why do we say cont. vocab. searching is precise? – because only articles indexed with that vocabulary term are retrieved.
- Select the most specific cont. vocab. term available for your concept; that’s how indexers apply them!
# Database-specific Controlled Vocabularies

Some major databases: | Has controlled vocabulary?
---|---
PubMed | YES – MeSH
Cochrane Library | YES – MeSH
EMBASE | YES – Emtree
Web of Science | No
SCOPUS | No
PsycINFO | YES – Thesaurus
Global Health | YES – Thesaurus
CINAHL | YES – CINAHL Headings
ERIC | YES – Descriptors
Controlled vocabulary in PubMed

- **MeSH (Medical Subject Headings)**
  - NLM’s controlled vocabulary to search Medline (PubMed)
  - Over 22,000 terms
  - Don’t guess – check the MeSH Database for what the controlled vocabulary term is for your concept.

<table>
<thead>
<tr>
<th>Natural language</th>
<th>MeSH Term</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health screening</td>
<td>Mass Screening [MeSH]</td>
</tr>
<tr>
<td>Emergency department</td>
<td>Emergency Services, Hospital [MeSH]</td>
</tr>
<tr>
<td>Computed tomography</td>
<td>Tomography, X-Ray Computed [MeSH]</td>
</tr>
<tr>
<td>SARS</td>
<td>SARS Virus [MeSH]; Severe Acute Respiratory Syndrome [MeSH]</td>
</tr>
<tr>
<td>Reproductive health</td>
<td>Reproductive Medicine [MesH]; Reproductive Health Services [MeSH]</td>
</tr>
</tbody>
</table>
Step #1: Write Down Your Question
Then Identify Your Main Concepts

“What are the treatment margins being used in stereotactic body radiotherapy for lung cancer?”

Concepts:

(Concept 1) margins
(Concept 2) stereotactic body radiotherapy
(Concept 3) lung cancer
Now we translate the main concepts from your question into a searchable query.
Concepts to Query

(Concept 1) margins
(Concept 2) stereotactic body radiotherapy
(Concept 3) lung cancer

Becomes (for a PubMed Search):

(“margin”) AND
(“Radiosurgery”[MeSH] OR “stereotactic body radiotherapy” OR “SBRT” OR “body radiosurgery” OR “extracranial radiosurgery”) AND
(“lung neoplasms”[MeSH] OR “lung cancer”)
Get To Know Your Databases’ Features

Does a database include/allow:

- Automatic term mapping?
- A controlled vocabulary for use in searching?
- Vocabulary designated as major focus?
- Boolean operators (AND, OR, NOT)
- Adjacency or proximity searching?
- Required special syntax – e.g. “around keyword phrases” in PubMed to override Automatic Term Mapping; ‘around keyword phrases’ in EMBASE.
- Field tag searching? -- e.g. [tiab] in Pubmed
Questions?
Now let’s do another example in PubMed…

I will also show you:

• How to force keyword strings using double quotes

• Where the details box is and why you should pay attention to it

• How to send terms from MeSH database to PubMed and run the search

• How to combine concept sets with Boolean operators

• Open a MyNCBI account (important for saving searches AND NIH Public Access Policy Compliance – Bibliography Management)
Databases Other Than PubMed

• Regardless of where you are searching, the process is the same.

• Always write down your question, identify the main concepts, create a searchable query by combining database-specific controlled vocabulary with keyword terms and phrases, perform the search, and evaluate the results.
Reminders -- final thoughts

• Testing/revising your search strategy:
  – It’s not about the number of hits per se.
  – It’s whether the strategy captured on-topic target articles – but not too many off-topic articles. It’s a trade-off: precision v. recall (kind of like specificity v. sensitivity)
  – Read a random sample of abstracts from your results.
  – Investigate why you got outlier articles.
  – Review the record for an on-topic article from your results to see the controlled vocabulary terms (e.g. in “Medline” display in PubMed) that were applied.
Reminders -- final thoughts (cont.)

- Continue to review your question – has it changed/evolved?
- Write it down
- Break out searchable concepts to create sets of terms
- Consult an expert searcher* -- your department’s assigned informationist for your literature searches.
- Invite her or him to be a team member, esp. on systematic reviews and content analyses, where the search results are the critical “inputs” for the project.

http://www.welch.jhu.edu/liaison/index.html
"As a statistician, I've often told clinicians that "We are the experts at analyzing data, please come to us for help, or let us do it for you. Don't just do it yourself, you might miss something." It was nice to hear the librarians tell me the same thing. They are the experts at searching the literature; we should go to them for help and not do it ourselves."

Marta Marsh Gilson, PhD, Assistant Professor, SOM, Surgery
Thanks!