Searching the biomedical literature basics:

“Painless” PubMed

Kendra Johnston, MISt

David Farley Chevrier, MLIS

OBJECTIVES

At the end of this workshop you will:

- Be better able to formulate a clear search question
- Be more familiar with PubMed: a key biomedical database
- Be able to conduct a successful search in PubMed using Automatic Term Mapping, PubMed Clinical Queries, & Advanced Search

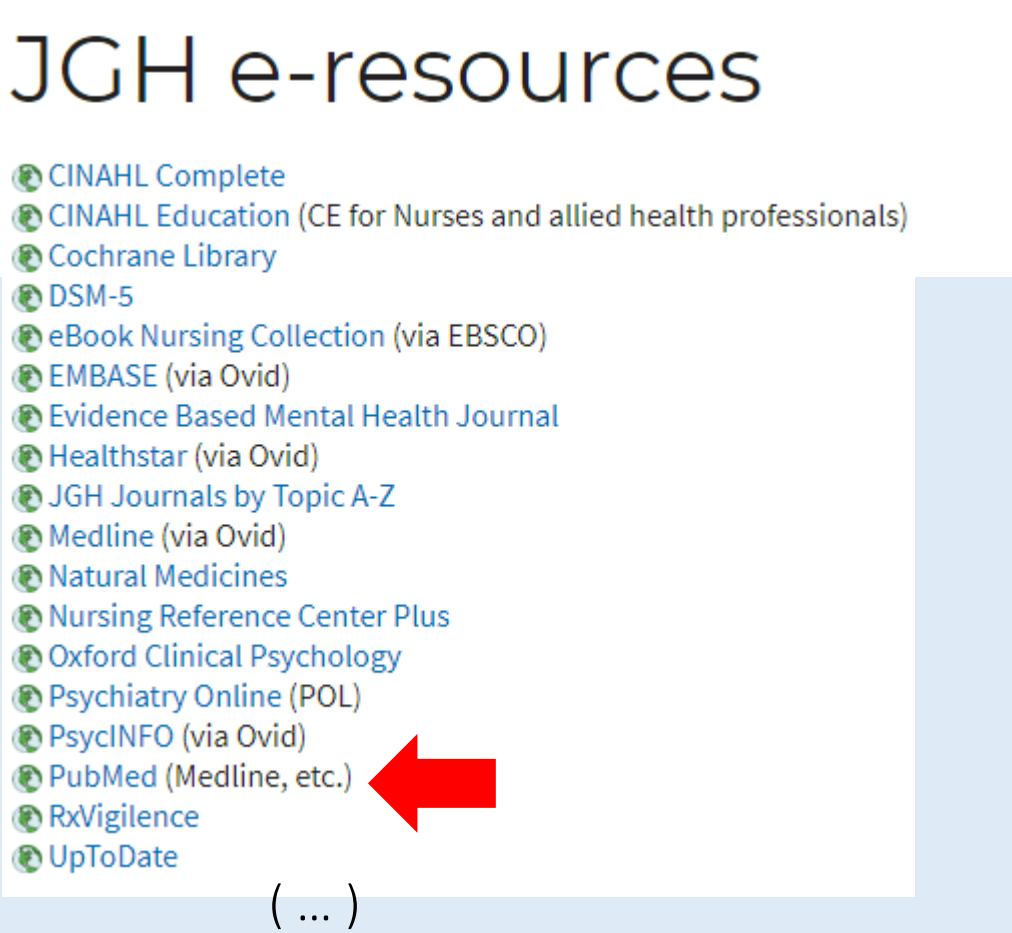
Getting to the database

If you are at JGH (PubMed with enhanced availability of full text):

- JGH Health Sciences Library Website Homepage > JGH e-Resources > **PubMed**
- Or go to: https://www.jgh.ca/care-services/health-sciences-library > Then scroll down and click on **PubMed**
- Or go to: Internet Explorer > Favorites > JGH Favorites > e-Ressources Bibliothécaires > **PubMed**

If you are in the CIUSSS, or at home:

- JGH Health Sciences Library Website Homepage > Free Online e-Resources > **PubMed**
- Or go to: https://www.ncbi.nlm.nih.gov/pubmed/



“Painless” PubMed

1. Scenario & Clinical Question
2. Basic Search: Using Automatic Term Mapping
3. Basic Search: Using PubMed Clinical Queries
4. Advanced Search
5. Reminder & References

What is PubMed?

PubMed is:

- The 1st biomedical database most health professionals learn how to use.
- Multidisciplinary.
- Freely accessible on the internet.
- Includes MEDLINE (peer reviewed journal selection) and PubMed Central (open access full text, the institutional repository of the national institute of health in the US).

Producer	National Library of Medicine, U.S.
Coverage & Updating	1950 to present, updated daily 5246 + journals indexed
Full text	Many Open Access/Free by PubMed Central and from publishers (more available if subscription to journal is held by your institution)
# of references	24 million + 500 000 + added every year
Languages	58+
Content	PubMed provides access to bibliographic information that includes MEDLINE, as well as: ▪Citations that precede the date that a journal was selected for MEDLINE indexing. ▪Some additional life science journals that submit full text to PubMed Central and receive a qualitative review by NLM. ▪PubMed Central- Open Access (= the institutional repository of the national institute of health)
Search Options	▪Subject headings (MeSH) and subheadings, AND, OR, limit by date, type of publication, age group, etc. ▪Keywords ▪Truncation using * ▪Clinical query filter: diagnosis, therapy, etiology, or prognosis.

1. Scenario and Clinical Question

Scenario

- You are a staff member in a long term care facility.
- The increasing rate of falls in older adult residents is of great concern to your management.
- You have been asked to investigate fall prevention programs that could possibly be implemented in your facility.

Identify Key Concepts with PICO

P (Patient or population) Whom is the question about?

I (Intervention or exposure) What intervention are you considering in the patient or population? Define

C (Comparison) If necessary, define what you are comparing your intervention or exposure to.

O (Outcome) Define your desired outcome

EXAMPLE

Question: You are looking for literature on fall prevention progams for older adults living in long term care facilities.

Population (older adults living in long term care facilities)

Intervention (fall prevention program)

Comparison (/)

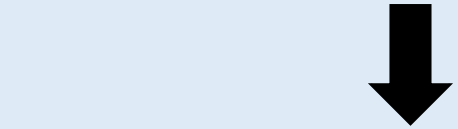
Outcome (reduced rate of falls in your facility)

Where to search for an answer:
In a biomedical database (like PubMed or CINAHL)

Identifying Key Concepts without PICO

Look at your question. Remove all extra words:

You are looking for literature on fall prevention progams for older adults living in long term care facilities.



~~You are looking for literature on~~ **fall prevention progams** ~~for~~ **older adults living in long term care facilities**.

2. Basic Search: Using Automatic Term Mapping

Automatic Term Mapping

- What is Automatic Term Mapping?

The algorithm behind the basic search box in PubMed. It was designed by librarians at the National Library of Medicine in the US designed to help you find what you are looking for quickly without needing to know how a biomedical database functions.

- How does it work?

Steps to a successful quick search

1) Identify the key concepts that you want to use
2) Enter the key concepts into the search bar using no punctuation or Boolean operators
3) Click search
4) Find the « sort by » menu
5) Make sure it is set to « Best match »
6) Use the filters on the left hand side of the page to limit your results (for example to only results in English and French, All adults, last 5 years…)

3. Basic Search: Using PubMed Clinical Queries

What is PubMed Clinical Queries ?

- The PubMed Clinical Queries Page is an evidence based tool within PubMed designed to help you quickly find the information / evidence you are looking for.
- It is designed limit one search by three clinical research areas: Clinical Study Categories, Systematic Reviews, or Medical Genetics.

Clinical Study Categories

- This column, situated on the left hand side of the page, offers five categories by which to limit your search:
  - Therapy (default): will retrieve clinical studies that discuss the treatment of disease.
  - Diagnosis: will retrieve clinical studies addressing disease diagnosis.
  - Etiology: will retrieve clinical studies addressing causation/harm in disease and diagnostics.
  - Prognosis: will retrieve clinical studies addressing disease prognosis.
  - Clinical Prediction Guides: will retrieve clinical studies which discuss methods for predicting the likelihood of disease presence or absence.

- The scope can be defined as Broad or Narrow:
  - Broad (default) : more articles = will include more results with a maximum of relevant articles but will probably also include some that will be less relevant.
  - Narrow: fewer articles = will retrieve fewer and more targeted articles, but might not include all relevant articles.

Steps to search by Clinical Study Category

1) Identify the key concepts that you want to use
2) Go to PubMed Clinical Queries, it is on the welcome page of PubMed, in the middle of the page under the column “PubMed Tools”
3) Enter the key concepts into the search bar using no punctuation or Boolean operators
4) Click search
5) Select a category in the Colum on the left hand side of the page “Clinical study category” according to the type of clinical studies you wish to retrieve
6) Review the 1st 5 results and decide if you need to change the scope from broad to narrow to better target your topic
7) If you would like to see all the results, click on “see all” under the 1st 5 results in the clinical study column on the left hand side of the page

Systematic Reviews

- This column helps you locate systematic reviews and similar articles.
- It is a good tool to use if you need to quickly find the best evidence on your topic.
- It limits your search to results identified in PubMed as systematic reviews, meta-analyses, reviews of clinical trials, evidence-based medicine, consensus development conferences, and guidelines.

Steps to Search for Systematic Reviews

1) Identify the key concepts that you want to use
2) Go to PubMed Clinical Queries, it is on the welcome page of PubMed, in the middle of the page under the column “PubMed Tools”
3) Enter the key concepts into the search bar using no punctuation or Boolean operators
4) Click search
5) The systematic review filter is automatically applied to your search, the results are in the middle column of the page
6) If you would like to see all the results, click on “see all” under the 1st 5 results in the systematic review column in the middle of the page

Medical Genetics

- This column helps you filter your search to studies in the field of Medical Genetics.
- If you would like help using this column ask your librarian.

4. Advanced Search

Keywords

- Keywords are words that appear in the record
- They are usually words in the title or abstract of the article and are in the authors vocabulary
- You will only find your keyword if it is in the article's record exactly as you have entered it (exact spelling, no plural, no synonyms…)
- You can use truncation *
- In PubMed you can search for keywords by using the Textword field

<u>Examples of Keywords:</u>

Cancer, Cancers, Cancerous, Tumor, Tumour, Tumors, Tumours, Carcinoma, Sarcoma, Neoplasm, Neoplasms, Neoplastic (…)

Subject Headings

- Subject headings are controlled vocabularies used to index contents in different databases,
- MeSH is the name of the controlled vocabulary used in MEDLINE,
- MEDLINE articles are indexed with MeSH by librarians at the National Library of Medicine in the US,
- PubMed Central Articles are not indexed with MeSH if they are not part also part of MEDLINE,
- If the indexing is perfect, when you search a subject heading, you will find all the articles about this topic,
- MeSH is organized in a tree,
- To explore the MeSH vocabulary you can use the MeSH browser.

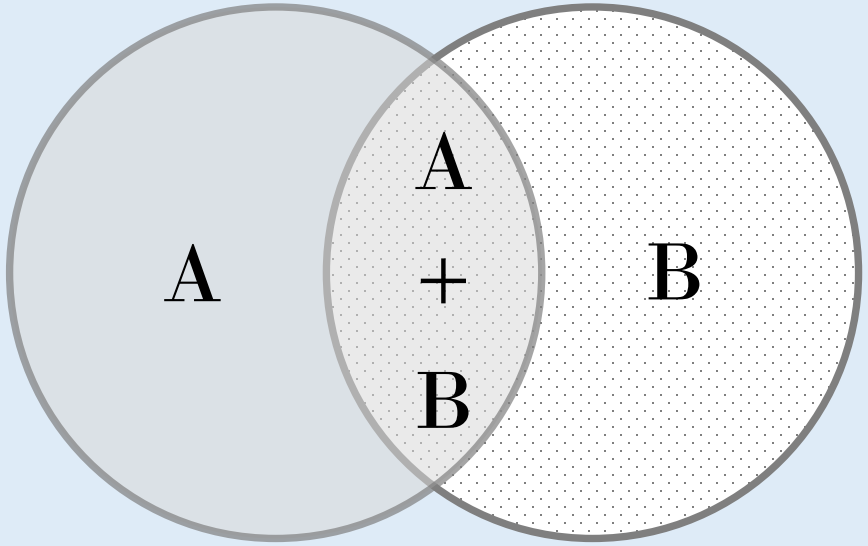
Example of MeSH: Neoplasms

Which should I use?

BOTH

- Indexing is never perfect as it usually done by humans
- There may not be a subject heading for your concept
  - Example: Concepts like “72 hours” or a very rare disease may not have a corresponding subject heading
- Searching using subject headings and keywords together works like building blocks: take one concept at a time and build your search
- Searching using only keywords is more imprecise:
  - Formulating a search with both subject headings and keywords will give you the best chance of getting as many relevant results as possible without having too many irrelevant results

BOOLEAN OPERATORS



Use Boolean operators to combine your concepts (Subject headings/keywords)

AND = A+B (both concepts must be included - use to build your final search, based on the PICO if you have one)

OR = A, A+B, B (either of selected concepts are included - use to combine Subject heading/keyword synonyms)

NOT = A only (use to see what has been excluded from one search combination compared

SEARCH ALGORITHM FOR BIOMEDICAL DATABASES

Subject Heading

OR

Keyword

AND

Subject Heading

OR

Keyword

=

Results

SEARCH ALGORITHM FOR PubMed

MeSH

OR

Textword

AND

MeSH

OR

Textword

=

Results

Concept Map

	AND	AND	AND	
	Concept 1	**Concept 2**	**Concept 3**	**Concept 4**
OR				
OR				
OR				

SYNONYMS

Steps to Search Using the Advanced Search

1) Search for your 1st concept using the MeSH Terms field
2) Click on “show index list” and select your concept
3) If your concept isn’t appearing as a MeSH term use the MeSH browser to find the appropriate MeSH term
4) Add it to your history using the “Add to history button”
5) Search for your 1st concept using the textword field
6) Click on “show index list” and select your concept
7) Add it to your history using the “Add to history button”
8) Repeat until you have included all possible MeSH Terms and Keywords for your 1st concept
9) In your search history click add beside each line that belongs to your 1st concept to add them to your search builder
10) In between each line you have added make sure to change the Boolean operator to OR

Steps to Search Using the Advanced Search

11) Repeat for each concept

12) Once you have built a search for each concept, go to the search history and add the final search line (the one where you used OR) for each concept to the search builder using the Add button beside the appropriate search line

13) In between each line you have added make sure the Boolean operator is AND

14) To see your results, click on the number of results beside your final search line in the search history

15) Use the filters on the left hand side of the result page to limit your results

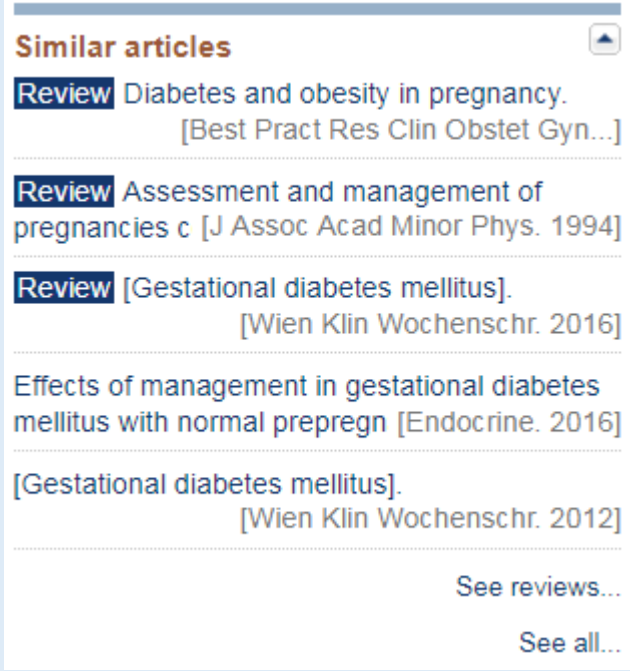
Create a Personal Account for PubMed: MyNCBI

- To save your searches
- To set up search alerts to stay informed of the latest developments on topics of particular interest to you

What to do when you are stuck?

- If you find one relevant article use it as a lead to find more:
  - Look at the subject headings used to index the article - reformulate your search
  - Find synonyms in the title or abstract
  - Snowball:
    - Use the “Similar Articles” function
    - Look at the references
  - Try another database
  - Try Google, or Google Scholar to learn more about the topic and maybe find more literature

- This is an iterative process



5. Reminder & References

REMINDER

- A Librarian is available to provide one-on-one instruction and help:

  @ JGH: **Kendra Johnston**, 514 340 8222 x22453
  kendra.johnston.ccomtl@ssss.gouv.qc.ca
  @Constance Lethbridge: **David Farley Chevrier**, 514 487 1891 x220
  david.farley-chevrier.clethb@ssss.gouv.qc.ca

- To access this presentation:

  https://www.jgh.ca/care-services/health-sciences-library/instruction/workshop-presentations-handouts/

REFERENCES

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2. Greenhalgh, T. (2014). How to read a paper: the basics of evidence-based medicine. John Wiley & Sons.
3. Frati, F., Touchette, J. (2015) The basics of searching biomedical databases, Presented at JGH

THANK YOU

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