How to search PubMed: The easy way

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Searching scares students!

• And Faculty too

• It’s too complex
• I get too much stuff
• Google is easier
• What have you heard the students say...?

• NOTE: This presentation was originally designed for students to use on their own... (so more text than I would have if presenting in person to a group or in a 1-on-1 session).
Searching by the Pics!

Reduces fear!!!
Easy translatable methodologies...
Instructions

• Get a piece of paper and something to write with...—preferably colored markers.

• Then cover the sheet of paper with dots all over it.
This is an example of: “All the published literature” each dot represents a journal...

We can’t see all of them but I’m sure you get the idea...there are lots, and lots of journals and lots, and lots of published articles within these journals.
Different Databases = Different Journals

Databases index journal articles so that the articles can be located.

Some journals are unique and these articles are indexed only in one database like the ones on the right side.

Other journals may be indexed in more than one database as in the overlapping circles on the left side.

Indexing refers to the organization of data according to a specific plan...like “tags” in Twitter.
For this exercise we will be looking at just one database, PubMed. Just one of the circles on the previous screen.

As of 2019, it contained over 29 million articles going back to the 1960s.

The next slide begins the exercise that you will be doing today with the dots on your paper and following along on the database screens.

Label items as we go thru this exercise!
The library homepage is at: http://www ttuhsc.edu/libraries

Click on the PubMed Icon:

This will bring you to the PubMed Homepage.

For full functionality of the databases, including access to full-text, one must start at the library home page.
1) In the search box type in the “combination of letters” that create: diabetes

2) The database doesn’t recognize “words” but just the “combination of symbols.”

3) Let’s see how PubMed interprets this request for articles on the next screen.
The database searches for this “combination of symbols” anywhere in the electronic record, including in the journal title, the article title, the author’s name, also in the abstract...

Will it locate DIABETIC using this search?

NO! it only looks for the “combination of letters”…not the meaning of the word.

NOTE: Your numbers will be different because the database is updated daily.
1) Return to the PubMed homepage, click on “MeSH Database.”

2) MeSH stands for Medical Subject Headings. One can search by CONCEPT when using MeSH.
1) On the MeSH page, type “diabetes” into the search box.

2) MeSH is the controlled vocabulary used for indexing articles.

3) Click on “Search.” If there is a match, it will show up on the next screen.
1) There are 100 possible matches.
2) Select the appropriate one. Click on the word(s) themselves.
3) The next screen helps to refine your topic, if needed.
If you want EVERYTHING about your subject all you have to do is: “Add to search Builder” then “Search PubMed”.

The next screen shows our actions on the dots page.
Using PubMed’s MeSH feature, we will only search for those articles that are tagged or indexed for our subject term, ONLY inside of the MeSH circle.

The numbers in the screen shot show how many articles are within the entire MeSH circle/pie.

Label your large circle: MeSH.
What do Adjectives do?
Choosing one subheading:

prevention and control

MeSH Subheading

- analysis
- anatomy and histology
- blood
- blood supply
- cerebrospinal fluid
- chemical synthesis
- chemically induced
- chemistry
- classification
- complications
- congenital
- diagnosis
- diagnostic imaging
- diet therapy
- drug therapy
- economics
- education
- embryology
- enzymology
- epidemiology
- ethnology
- etiology
- genetics
- history
- immunology
- metabolism
- microbiology
- mortality
- nursing
- organization and administration
- parasitology
- pathology
- physiology
- physiotherapy
- psychology
- radiotherapy
- rehabilitation
- statistics and numerical data
- surgery
- therapy
- transmission
- urine
- veterinary
- virology

Restrict to MeSH Major Topic.

Do not include MeSH terms found below this term in the MeSH hierarchy.
If you want to focus your topic...then select the option “Restrict to MeSH Major Topic.”

As when horses wear blinders to help them focus on the race and not be distracted...

This option will search only the narrower more focused articles found in the inner circle.
Diabetes Mellitus

A heterogeneous group of disorders characterized by HYPERGLYCEMIA and GLUCOSE INTOLEANCE.

Here we have selected: a "subheading" and a "Major focus"
As you see here, now we are only retrieving the “Tip of the Iceberg” (black triangle)!

“ADVANCED” This your locker that holds everything

Here you see the numbers for each section. This is still too many.

<table>
<thead>
<tr>
<th>Search</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Diabetes Mellitus/prevention and control&quot;[Majr]</td>
<td>13179</td>
</tr>
<tr>
<td>&quot;Diabetes Mellitus/prevention and control&quot;[Mesh]</td>
<td>22400</td>
</tr>
<tr>
<td>&quot;Diabetes Mellitus&quot;[Majr]</td>
<td>291502</td>
</tr>
<tr>
<td>&quot;Diabetes Mellitus&quot;[Mesh]</td>
<td>364563</td>
</tr>
<tr>
<td>diabetes</td>
<td>591803</td>
</tr>
</tbody>
</table>

Tip of iceberg
Entire triangle
Inner Circle
Big circle
All the dots
Once you have strategized your concept then you can figure out ways to narrow your topic down.

Typically you may want to combine two or more concepts...
How you combine your concepts will make a difference in results!
Using the “OR” sometimes called “Boolean OR”...you will get ALL variations of your concepts, those that deal with one concept “OR” the other “OR” even those citations that have both concepts in the same article. For example, if you had concept A as well as concept B...having overlapping circles...the searcher would get the citations that have “A” concept “OR” the ones that have “B” concept and even those articles that have both “A” and “B” in the intersection of the circles.
OR

You might be interested in “Either” “Diabetes Mellitus” OR “Hypertension”

You could then “AND” these articles to narrow down to just the intersection as shown in the next slide.
AND

AND will only give you the articles that appear in the overlap area. “A AND B”
USING “OR” WITH “AND”

So we have “A” OR “B” and now we want to add a concept: e.g. Hispanic Americans (the Blue circle).

“A” OR “B” AND “C” Hispanic Americans

We would retrieve ONLY these articles in dark blue zig zag area.
So we have “A” AND “B” and now we want to add a concept:
e.g. Hispanic Americans (the Blue circle).

“A” AND “B” AND “C”
Hispanic Americans

We would retrieve ONLY these articles in dark blue zig zag area.

This is a way that we can be more specific in our research.
1) What is your question?

This part of the exercise helps the student define WHAT they are looking for...

NOW…. What is the MOST important part of research…?
Word/Abstracting Exercise.

Students will often turn to GOOGLE to do their research...

here are some advanced techniques to use with the GOOGLE located article
Evaluation of Preeclampsia Results after Use of Metformin in Gestation: Systematic Review and Meta-analysis.

Nascimento IBD\textsuperscript{1}, Dienstmann G\textsuperscript{1}, de Souza MLR\textsuperscript{1}, Fleig R\textsuperscript{1}, Hoffmann CBPC\textsuperscript{1}, Silva JC\textsuperscript{1}.

Abstract in English, Portuguese

**OBJECTIVE:** Does the use of metformin have an influence on the outcomes of preeclampsia (PE)?

**SOURCES OF DATA:** The descriptors *pregnancy, metformin, treatment,* and *preeclampsia* associated with the Boolean operators AND and OR were found in the MEDLINE, LILACS, Embase and Cochrane databases. A flowchart with exclusion criteria and inclusion strategy using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) protocol, and eligibility criteria was used. Data were extracted regarding the type of study, the applied dosage, treatment time, segment, bias risks, and the Patient, Intervention, Comparison and Outcome (PICO) strategy to identify the quality of the study.

**SELECTION OF STUDIES:** Total number of journals in the initial search ($n = 824$); exclusions from repeated articles on different search engines ($n = 253$); exclusions after reading the titles, when the title had no correlations with the proposed theme ($n = 164$); exclusions due to incompatibility with the criteria established in the methodological analysis ($n = 185$), exclusion of articles with lower correlation with the objective of the present study ($n = 187$); and final bibliographic selection ($n = 35$).

**DATA COLLECTION:** At first, a systematic review of the literature was performed. Subsequently, from the main selection, randomized and non-randomized trials with metformin that presented their results in absolute and relative numbers of PE outcomes were selected. The variables were treated statistically in the meta-analysis with the Review Manager software (RevMan), version 5.3. Copenhagen: Nordic Cochrane Centre, The Cochrane Collaboration. Denmark in the Hovedistaden region.

**SYNTHESIS OF DATA:** The study showed that metformin presented greater preventive effects for pregnancy-induced hypertension and was less effective for PE.

**CONCLUSION:** Metformin may gain place in preventive treatments for PE, once the dosages, the gestational age, and treatment time are particularly evaluated. A methodological strategy with an improved perspective of innovative and/or carefully progressive dosages during pregnancy to avoid side effects and the possibility of maternal-fetal risks is suggested.
Evaluation of Preeclampsia Results after Use of Metformin in Gestation: Systematic Review and Meta-analysis.
Nascimento IBD¹, Dienstmann G¹, de Souza MLR¹, Fleig R¹, Hoffmann CBPC¹, Silva JC¹.

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Thieme Revinter Publicações Ltda Rio de Janeiro, Brazil.

PMID: 30399639 DOI: 10.1055/s-0038-1675214

List Important words/concepts that are found in abstract:—
1. metformin
2. pregnancy...
3. 
4. 

Now copy your abstract...and take it into...
Any one of the many WORD CLOUD software programs!

https://www.wordclouds.com/
So how do you use these skills?

Using our new found knowledge...the student suggests a topic for us to research...
The librarian assists in formulating and answerable question...based on idea
What other information does the article help you with?

Lists of indexing terms (MeSH) terms that can be used for refining your search!
The rationale, design, and baseline characteristics of PREVENT-DM: A community-based comparative effectiveness trial of lifestyle intervention and metformin among Latinas with prediabetes.

Perez A\textsuperscript{1}, Alos VA\textsuperscript{1}, Scanlan A\textsuperscript{2}, Maia CM\textsuperscript{1}, Davay A\textsuperscript{3}, Whitaker RC\textsuperscript{4}, Foster GH\textsuperscript{5}, Ackermann RT\textsuperscript{6}, O'Brien MJ\textsuperscript{7}.

Abstract
Promotora Effectiveness Versus Metformin Trial (PREVENT-DM) is a randomized comparative effectiveness trial of a lifestyle intervention based on the Diabetes Prevention Program delivered by community health workers (or promotoras), metformin, and standard care. Eligibility criteria are Hispanic ethnicity, female sex, age ≥ 20 years, fluent Spanish-speaking status, BMI ≥ 23 kg/m\(^2\), and prediabetes. We enrolled 92 participants and randomized them to one of the following three groups: standard care, DPP-based lifestyle intervention, or metformin. The primary outcome of the trial is the 12-month difference in weight between groups. Secondary outcomes include the following cardiometabolic markers: BMI, waist circumference, blood pressure, and fasting plasma glucose, hemoglobin A1C (HbA1c), total cholesterol, triglycerides, LDL cholesterol, HDL cholesterol, and insulin. PREVENT-DM participants are socioeconomically disadvantaged Latinas with a mean annual household income of $15,527 ± 9922 and educational attainment of 9.7 ± 3.6 years. Eighty-six percent of participants are foreign born, 20% have a prior history of gestational diabetes, and 71% have a first-degree relative with diagnosed diabetes. At baseline, PREVENT-DM participants had a mean age of 45.1 ± 12.5 years, weight of 178.8 ± 39.3 lbs, BMI of 33.3 ± 6.5 kg/m\(^2\), HbA1c of 5.9 ± 0.2%, and waist circumference of 97.4 ± 11.1cm. Mean baseline levels of other cardiometabolic markers were normal. The PREVENT-DM study successfully recruited and randomized an understudied population of Latinas with prediabetes. This trial will be the first U.S. study to test the comparative effectiveness of metformin and lifestyle intervention versus standard care among prediabetic adults in a "real-world" setting.

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KEYWORDS: Diabetes prevention; Hispanic Americans; Lifestyle intervention; Metformin; Obesity

PMID: 26597415 PMCID: PMC4674352 DOI: 10.1016/j.cct.2015.10.011
[Indexed for MEDLINE] Free PMC Article

Click on the MeSH terms which you will find under the full citation of most of your articles. When you click on that it will show you the headings that have been used to tag this article. See the next slide.
Here are the MeSH headings for the article that was just located. When you click on an individual heading it will give you a number of options. When you choose the option to “Search in MeSH” you will find more information on the term.

Indexers index to the most specific term, so you may consider choosing this term and “AND”ing with your other subject headings.
Now that you know how to manipulate the database...you can locate other MeSH subject headings to assist with your research. Here are a few examples:

**Probability**

- The study of chance processes or the relative frequency characterizing a chance process.
- Year introduced: 1968(1964)

**PubMed search builder options**

- **Subheadings:**
  - classification
  - economics
  - ethics
  - history
  - legislation and jurisprudence
  - manpower
  - methods
  - organization and administration
  - standards
  - statistics and numerical data
  - supply and distribution
  - trends
  - utilization

- **Restrict to MeSH Major Topic.**
- **Do not include MeSH terms found below this term in the MeSH hierarchy.**

**Tree Number(s):** E05.318.740.600, G17.680, N05.715.380.750.625, N06.850.520.830.600

**MeSH Unique ID:** D011336

**Entry Terms:**

- Probabilities

**All MeSH Categories**

- Analytical, Diagnostic and Therapeutic Techniques and Equipment Category
- Investigative Techniques
- Epidemiologic Methods
- Statistics as Topic

**Probability**

- Bayes Theorem
- Likelihood Functions
- Markov Chains
- Odds Ratio
- Pairwise Specific Scoring Matrices
- Propensity Score
- Proportional Hazards Models
- Risk

- Logistic Models
- Protective Factors
- Risk Assessment
- Risk Factors
- Uncertainty

**Research Design**

- Control Groups
- Double-Blind Method
- Early Termination of Clinical Trials
- Meta-Analysis as Topic
- Network Meta-Analysis
- Patient Selection
- Random Allocation
- Sample Size
- **Numbers Needed To Treat**
Before you begin searching...

Identify...
Identify the **WHY**?

What issue, problem do you want to solve?

**How** could you make someone’s life better?

What are you **passionate** about that brought you to this topic?

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**PICO Worksheet**

Name: ________________________  Date: ________________________

**PICO**  Search terms (synonyms, alternate spellings, abbreviations, etc.)

P (patient/population/problem)
What is the primary problem?

I (intervention)
What main intervention are you considering?

C (comparison)
What will the intervention be compared to?

O (outcome)
What are you trying to accomplish?

**Type of Question** (circle one):

- Therapy
- Diagnosis

Etiology/Harm
- Prognosis
- Other ________________________

**Question:**
Using the above information, write a focused, well-articulated question on the topic/idea that you want to answer.

__________________________________________________________

__________________________________________________________

__________________________________________________________

*Rev. 1/2019*
Play the matching game!
List 5-10 important terms that you think would help you locate articles on your topic.

These are pieces that you have to work with.

Subheadings are the modifiers.

Filters will be types of articles, or age of patient, language etc.
Review articles on the prevention of knee injuries in female adolescent soccer players.

I always suggest that all the subject terms are searched before any filters are applied.

This is a matching game example!
Create this on a sheet of paper

To begin your research enter your terms here...

_____________________

_____________________

_____________________

_____________________

_____________________

_____________________

Subject

SH

subheading

Filter

ilter
Now...it’s your turn!

Take another sheet of paper and create a picture with circles and triangles “AND”s and “OR”s how you would search your topic.
This has been successfully used--

In 1-0n-1 person to person demonstrations...with the student then taking the lead on their topic
Large group presentations...
Embedded into a Nursing class curriculum
Presented at regional meeting...with high praise...

I try to teach to success levels...

One can always come back for more specific tips and tricks.
Independent Assignment
These are pieces that you have to work with.

Filters will be types of articles, or age of patient, language etc.
Sketch your proposed search strategy

This is just an example you may use different combinations
Label your sketch using terms you are searching with.
Using the terms that you have identified, locate articles that may answer your topic.

Do this search ONLY in PubMed using Mesh headings.

Compare your terms with the MeSH terms you have located...sometimes you may need to locate synonyms.

**My terms**

**MeSH headings that I used**
Take screen shots of your strategy.

Copy 3-5 citations that answered your question.
Create Word Cloud

• Using words in the abstract only (of the best article) create a Word Cloud.

https://www.wordclouds.com/
Results

• Briefly describe if your results appropriately answered the question you were asking.
The NEW version will also work... after this exercise the student will understand how the pieces fit together
Thank you!

If you have any questions please contact Margaret Vugrin at

margaret.vugrin@ttuhsc.edu or 806-743-2241