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Clinical Decision Making:
Using PubMed to Search for the Best Evidence

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Learning Objectives

◦ After this session, you will be able to:

◦ Construct a searchable clinical question using PICO

◦ Conduct a basic keyword search in PubMed

◦ Carry out an advanced search in PubMed using MeSH

◦ Limit the results of your search to higher levels of evidence

◦ Use Clinical Queries to find high quality articles quickly

◦ Find specific citations using Single Citation Matcher

◦ Save Searches and create auto-alerts with MyNCBI

Agenda

- ◦ PICO
- ◦ Practice
- ◦ Keyword searching in PubMed
- ◦ Practice
- ◦ Subject searching in PubMed - MeSH
- ◦ Practice
- ◦ Limiting searches in PubMed
- ◦ Clinical Queries
- ◦ Single Citation Matcher
- ◦ Practice
- ◦ My NCBI

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Creating a Searchable Question

Pull out the most important concepts first. A good tool to use is…

P = Patient

I = Intervention

C = Comparison (if any)

O= Outcome

Consider the following scenario…

In postmenopausal women, does HRT decrease the risk of Alzheimer's Disease?

What's our PICO?
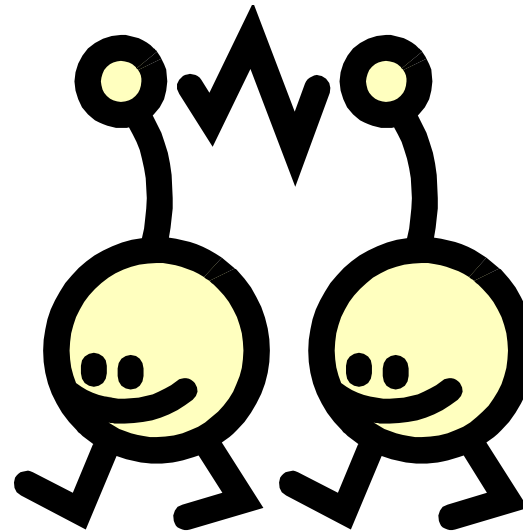
P – postmenopausal women
I – HRT
C – None
O – Decreased risk of Alzheimer's Disease

What about Synonyms?

◦ Postmenopausal Women
  • Postmenopause? Female?
◦ HRT
  • Hormone replacement therapy?
◦ Decreased risk of Alzheimer's
  • Dementia?

Practice Time

Work on the PICO for the first three examples in your handout.

Answers

1. In patients with the "common cold" (viral URI), is zinc a safe and effective treatment option?

	Initial Question	Alternate Vocabulary
P_{atient}	Common Cold	Viral URI, upper respiratory infection, rhinovirus,
$I_{ntervention}$	zinc	
$C_{omparison}$	Placebo or none	
O_{utcome}	Reduce or cure symptoms	

Answers

2. Does administration of the MMR vaccine in childhood increase the future risk of developing autism?

	Initial Question	Alternate Vocabulary
P_{atient}	Children	Kids, 0-18, 6-12?
$I_{ntervention}$	MMR vaccine	Measles, mumps, rubella vaccine
$C_{omparison}$	N/A	
O_{utcome}	Increased risk for autism	Autism spectrum disorder, or autistic disorder

Answers

3. In a patient with acute abdominal pain where you are mainly worried about appendicitis, how does abdominal CT scan compare to ultrasonography in its ability to accurately diagnose appendicitis and thereby minimize unnecessary or delayed surgery?

	Initial Question	Alternate Vocabulary
P_{atient}	Acute abdominal pain, appendicitis	
$I_{ntervention}$	Abdominal CT scan	Abdomen, computed tomography
$C_{omparison}$	Ultrasonography	Ultrasound
O_{utcome}	Accurate diagnosis for appendicitis	

Searching PubMed

◦ What is it?

- PubMed is the premier health sciences database with over 19 million citations.

- Works best if you search one concept at a time

- Choice of keyword searching and/or subject (MeSH) searching

- Important to understand limits! – We'll talk about this more later on.

- **Don't forget that PubMed is NOT the only resource you can use!!!**

Let's Try a Search

- P= postmenopausal or postmenopause, woman or female
- I = HRT or hormone replacement therapy or hormone replacement therapies
- C = None
- O = decreased Alzheimer's, decreased dementia

What do we search first?

Practice Time

Now, try running searches for the first three exercises in your handout. We will go over each search together once you are finished.

What is MeSH?

- Labels for article
- Think of a folder in a file cabinet

Taxes

Why Bother Using MeSH?

1. Just because an article contains a word does not mean the article will be about that topic

2. Synonyms and different spellings

   a) Example: heart attack a.k.a. myocardial infarction

   b) P**e**diatrics in U.S. vs. p**ae**diatrics in Great Britain

   c) Diagnosis or diagnostics or diagnoses

3. Some words are spelled the same

   a) Tears from your eyes vs. tears in cartilage

Why Keywords?

- Indexing takes time
- Some concepts are too specific for a controlled vocab
- Articles are indexed by humans

Using MeSH in PubMed

Let's look at our example from before.

P= postmenopausal or postmenopause, woman or female

I = HRT or hormone replacement therapy

C = None

O = decreased Alzheimer's, decreased dementia

What do we search first?

Practice Time

Work on the PICO, alternative vocabulary and MeSH for exercises 4 and 5 in your handout.

Answers

4. In a child with acute otitis media, is treatment with an antibiotic necessary for a good outcome?

	Initial Question	Alternate Vocabulary	MeSH
P_{atient}	Child, otitis media	Kid, 0-18, ear infection,	("Otitis Media/drug therapy"[Mesh] OR "Otitis Media/therapy"[Mesh])
I_{ntervention}	Antibiotics	Anti-bacterial agents, specific drug names	"Anti-Bacterial Agents"[Mesh] or [pharm. Action]
C_{omparison}	Placebo, waiting		"Placebos"[Mesh] or "Watchful Waiting"[Mesh]
O_{utcome}	Cure ear infection	Remove symptoms	

Answers

5. How safe is home birth in the United States?

	Initial Question	Alternate Vocabulary	MeSH
P$_{atient}$	Women, pregnant	Female, pregnancy	"Pregnancy"[Mesh]
I$_{ntervention}$	Home birth	delivery at home, childbirth at home	"Home Childbirth"[Mesh]
C$_{omparison}$	Hospital birth	Inpatient delivery	"Parturition"[Mesh] and ("Hospitals"[Mesh] OR "Inpatients"[Mesh])
O$_{utcome}$	safety	Adverse effects, contraindications	"Safety"[Mesh] OR subheadings for "adverse effects" or "contraindications"

An Introduction to Limits

- Many databases have an option for Limits
- Some examples of limits are:
  - Age
  - Gender
  - Publication date
  - Language
  - Publication type (We'll come back to this)
  - Etc.
- Save your limits till the end of your search!

Publication Types

Publication Types by Question Type:
Different study types are suited to different questions. For example:

Most Clinical Questions: Meta-analyses, systematic reviews

Therapy: Randomized Controlled Trial

Diagnosis: Prospective, blind controlled trial compared to gold standard

Prognosis: Cohort study, case control, case series/case report

Systematic
Reviews

Critically –
Appraised
Topics

Critically –Appraised
Individual Articles

Randomized Controlled Trials

Cohort Studies

Case-Controlled Studies
Case Series/Reports

Background Information/Expert Opinion

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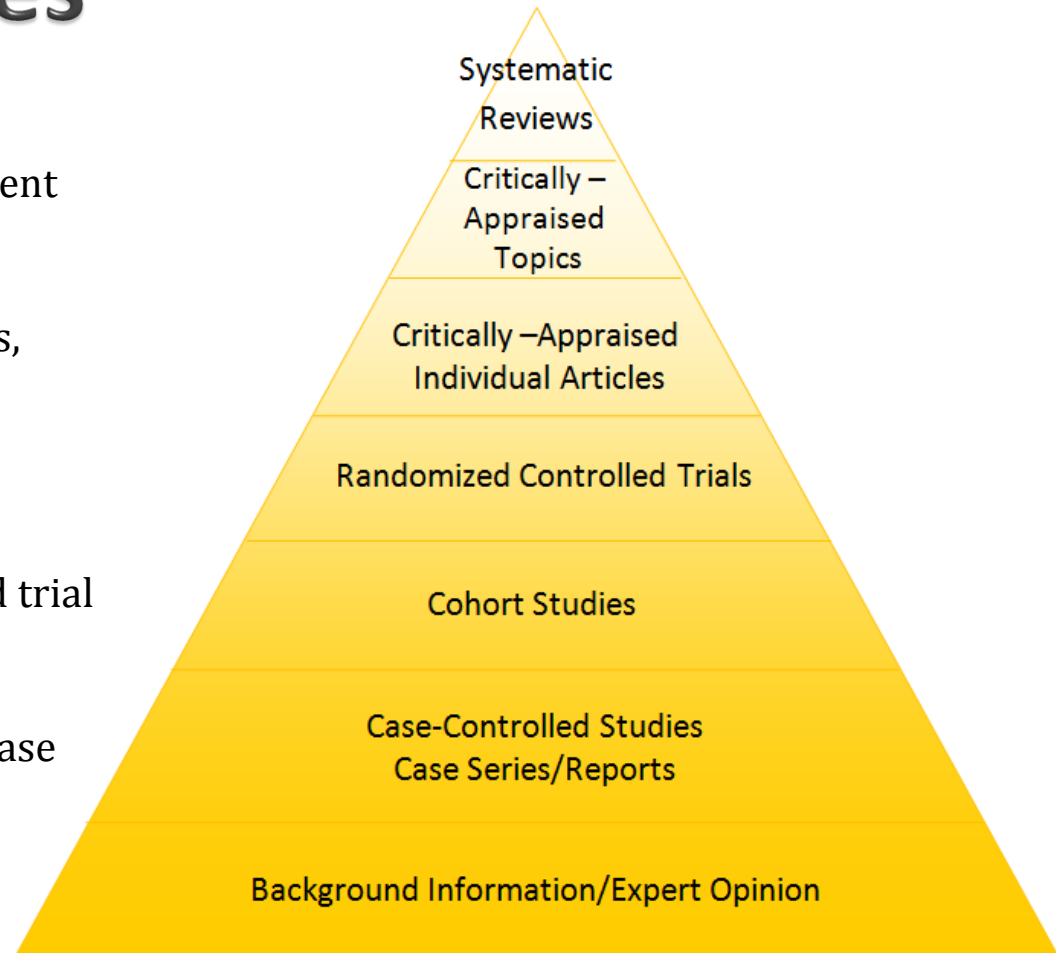
Combining MeSH with Limits

A 54 year old woman comes to you office. She is clinically depressed, but morally opposed to taking any sort of prescription medication. She wants to know if using St. John's Wort would be just as good as taking a traditional antidepressant.

Type of Question: Therapy

P – female, 54, depression
I – St. Johns Wort
C – antidepressants
O – Reduction in symptoms, cured of depression.

Appropriate Publication Types – systematic reviews, meta-analysis, randomized controlled trials.

Clinical Queries

◦ Useful for quick point of care questions
◦ Can be used with your search history

Single Citation Matcher

- ◦ Useful for citations found in PubMed
- ◦ Located under the Advanced Search
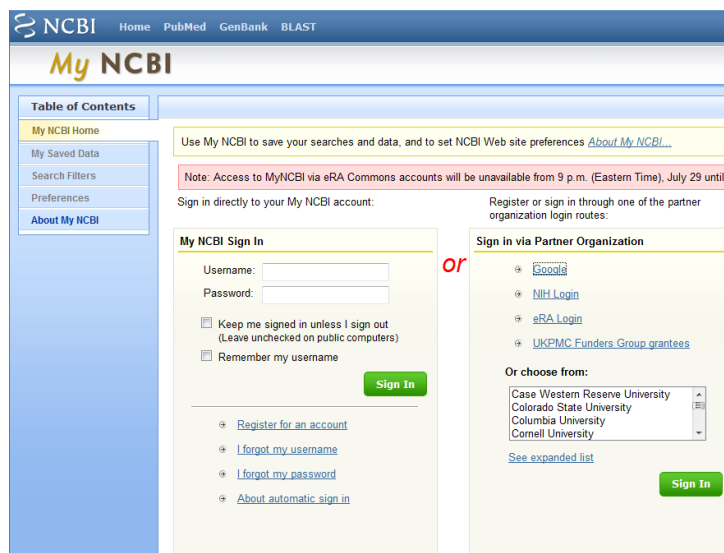
Last Practice Session

◦ Work on the vignettes in your handout. Raise your hand when you are finished.
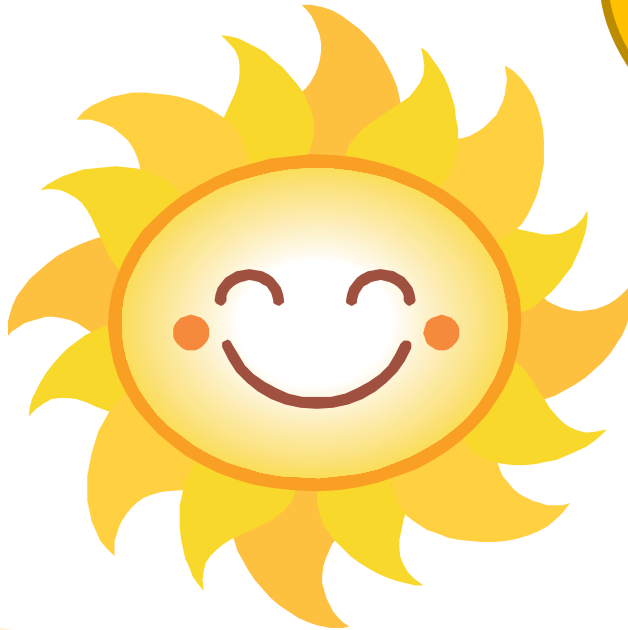
MyNCBI

- Allows you to save searches
- Set up auto-alerts
- Create bibliographies of your work
- Go ahead and create one today.

Questions?

- REMEMBER
  - Always access library resources from the Hardin website.
  - We are here to help you.