



How To Do Literature Search



Dr. Abdullah Bin Salamah

Family and Community Medicine
Department

College of Medicine, King Saud
University

Objectives

- To explain the role of searching the literature in conducting research
- To recognize the levels of evidence
- To differentiate the EBM resources
- To identify where to search for evidence
- To prepare proper search terms
- To perform Boolean operators and MeSH indexing
- To conduct literature search for evidence using Pubmed and Cochrane
- To summarize the literature review for the IRB



Why searching a literature?

Staying

- Staying current with advances in medicine

Identifying

- Identifying information and ideas

Increasing

- Increasing your breadth of knowledge

Identifying

- Identifying original works in your area

Carrying

- Carrying on from where others have already reached

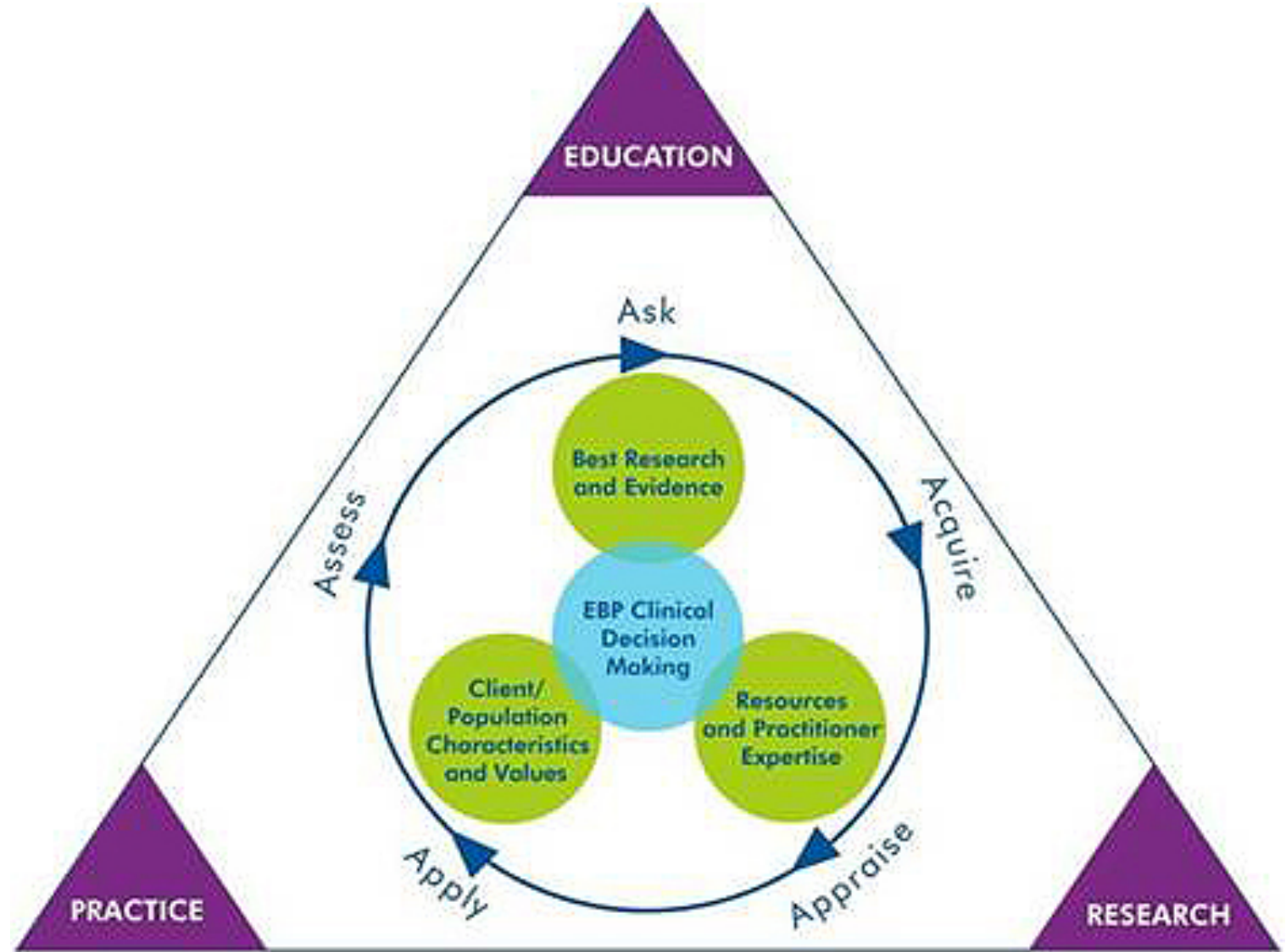
Avoiding

- Avoiding reinventing the wheel

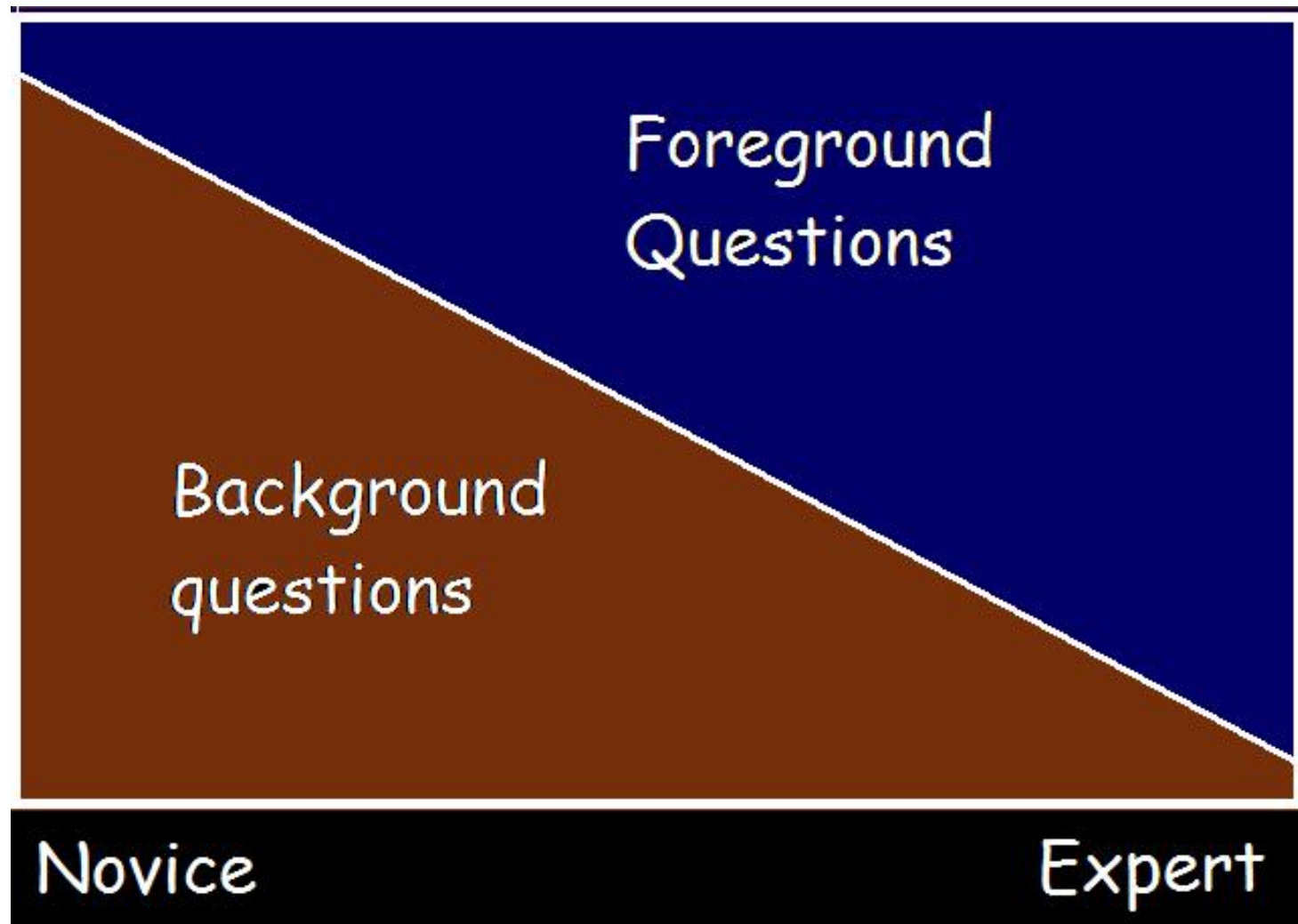
Putting

- Putting your work into perspective

5-step EBM process



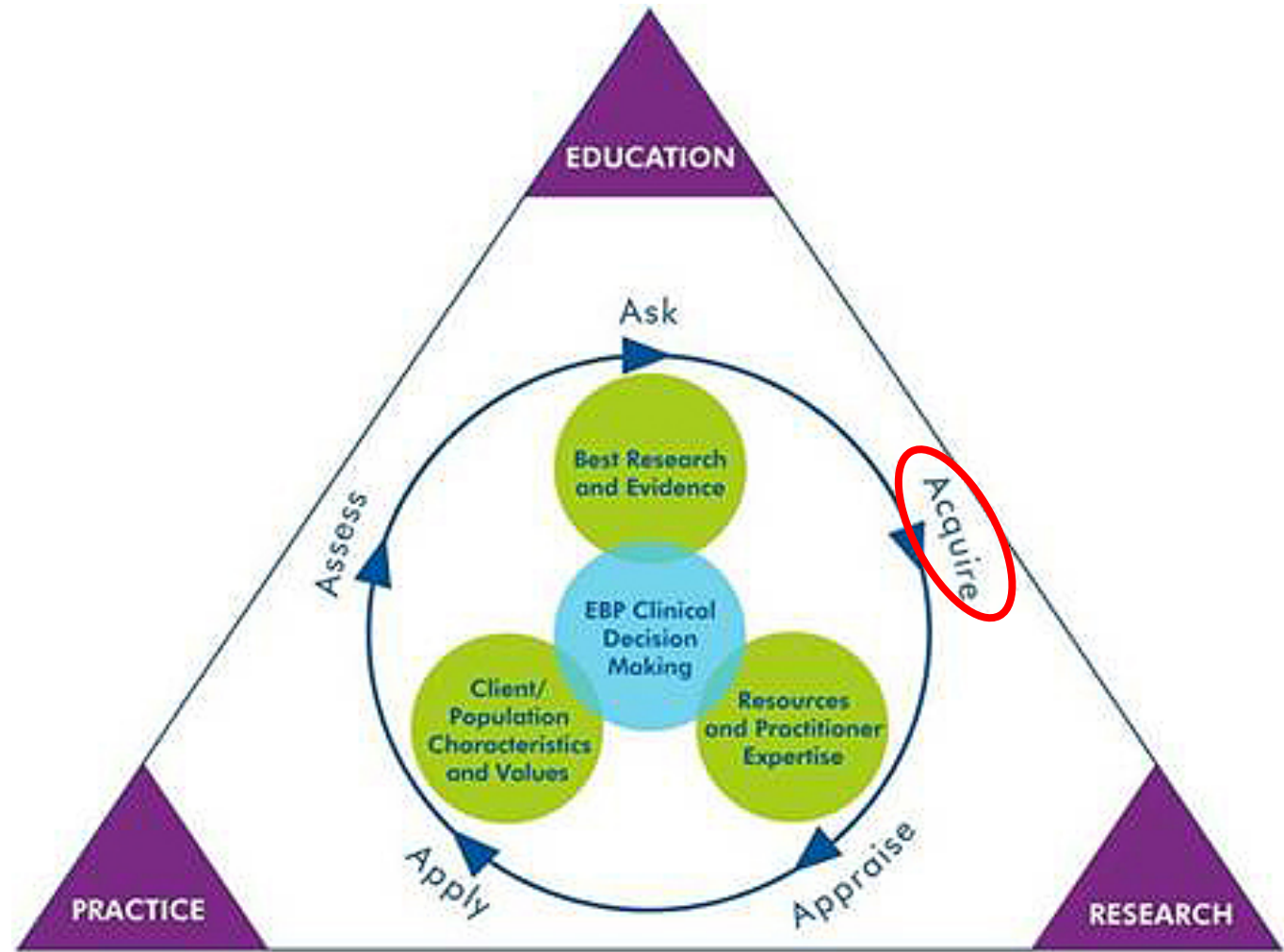
Foreground
Vs.
Background
EBM questions



Foreground OR Background?

- “What is malaria?”
- Are bed nets effective in lowering the incidence/prevalence of malaria in developing countries?

2nd step:
Acquire

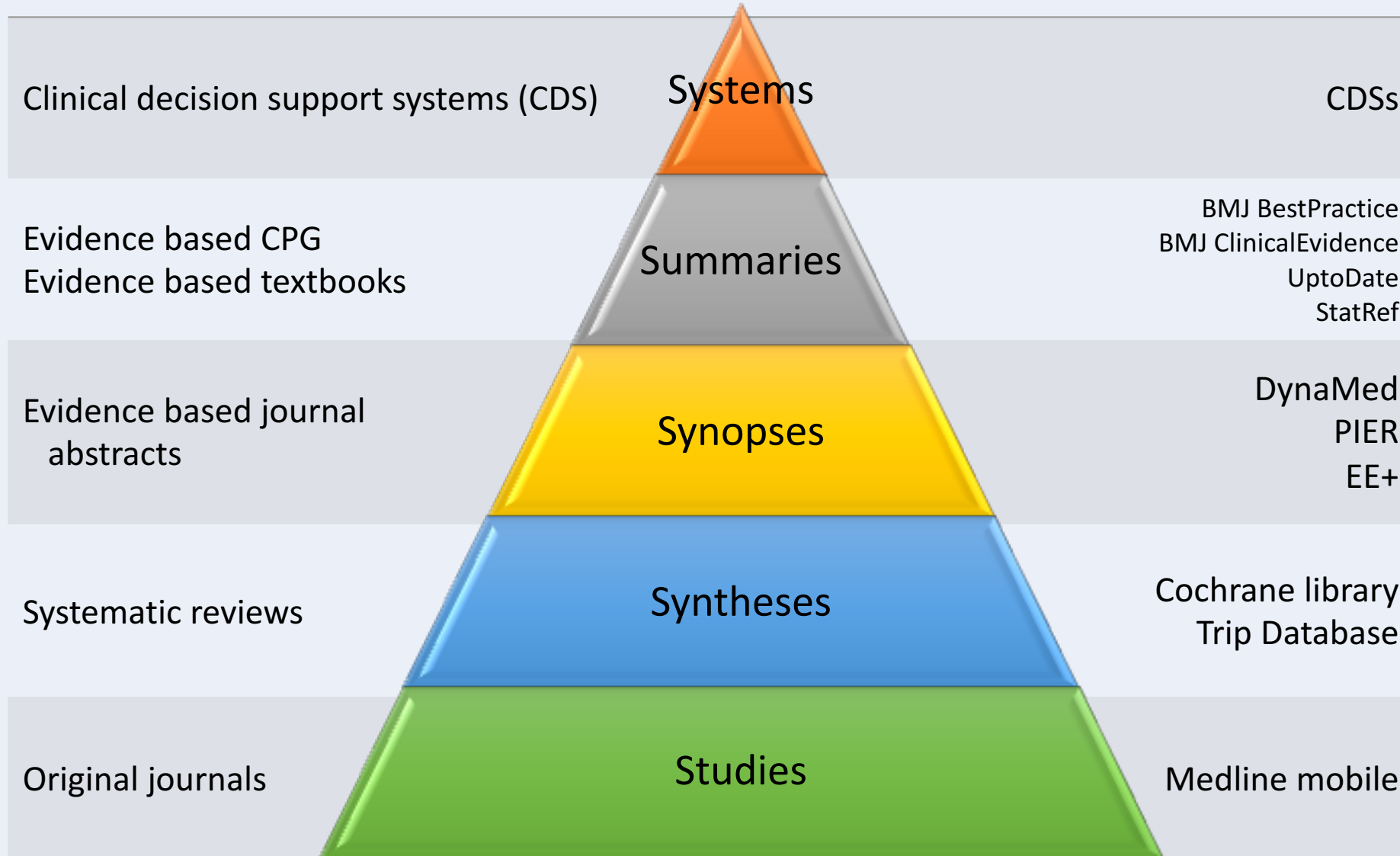


Where do you search for evidence?

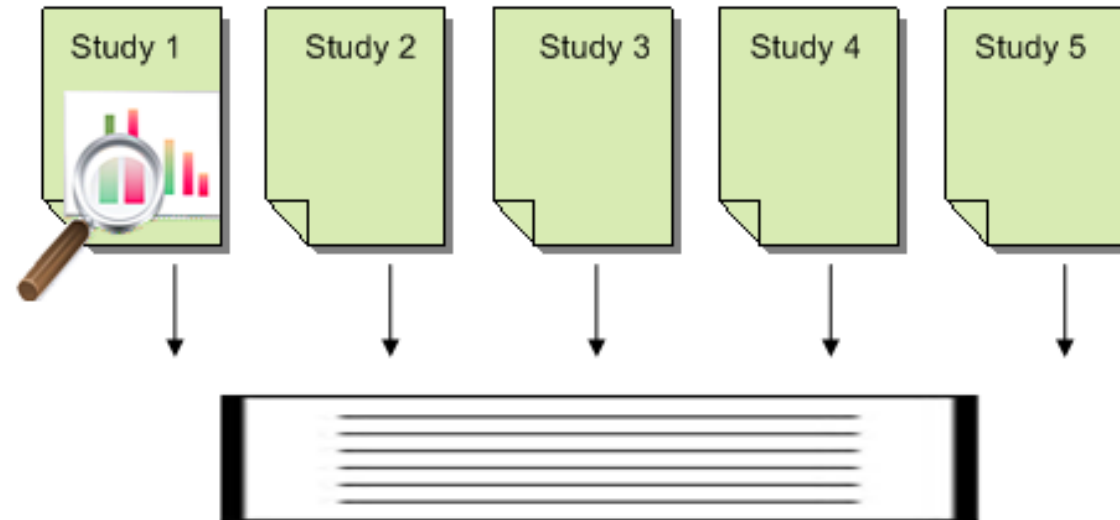
1. ACP Clinical Guidelines and Recommendations
2. BMJ BestPractice / Clinical Evidence
3. ClinicalKey / MDConsult
4. Cochrane Library
5. DynaMed
6. Essential Evidence Plus
7. Google Scholar
8. Medscape
9. PubMed
10. Saudi Digital Library
11. Skyscape
12. StatRef
13. TRIP Database
14. UpToDate
15. Web of Knowledge
16. WebMD (Med-U)
17. Other



Haynes' 5S pyramid of EBM resources

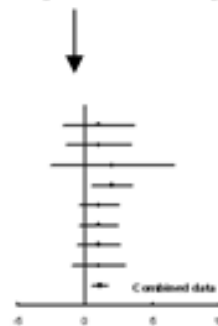


Systematic Reviews and Meta-analysis: Putting Results into Perspective



Systematic Review of Studies

A thorough, comprehensive, and explicit interrogation of the medical literature.



Meta-analysis

A statistical approach to combine the data derived from a systematic review.

What is Cochrane

- Archie Cochrane (1909-88)
 - British epidemiologist
 - Advocated RCTs to inform healthcare practice
- Cochrane collaboration
 - Cochrane Reviews (>4,000) registered
 - Identify, appraise and synthesise research-based evidence and present it in accessible format; updated on regular basis
 - Focus on interventions
 - Outstanding general resource



The School of Medicine,
Cardiff University and the
Cochrane Archive



Primary Resources

Global databases

- (Cochrane, PubMed, Health PubMed, Ovid, Science Citations, grey literature, etc.)

WHO databases

- (global / regional): observatories; scientific journals (WHO Bulletin / EMHJ); surveillance; surveys; ICTRP; CPG, etc.

National databases:

- ENSTINET, SaudiMedLit; NCHS, CAPMAS; healthcare delivery institutions (websites, reports); clinical trials; grey literature, etc.



PubMed

<https://www.ncbi.nlm.nih.gov/pubm>

PubMed is a database developed by the National Center for Biotechnology Information (NCBI) at the U.S. National Library of Medicine (NLM) available on the Web.

PubMed Health provides information for consumers and clinicians on prevention and treatment of diseases and conditions.

PubMed Health specializes in reviews of clinical effectiveness research, with easy-to-read summaries for consumers as well as full technical reports. Clinical effectiveness research finds answers to the question “What works?” in medical and health care.

NLM is the worlds largest medical library

NLM has been indexing the biomedical literature since 1879

MEDLINE is a database of indexes (with citations and abstracts)

PubMed provides access to MEDLINE

PubMed database is more current and comprehensive than MEDLINE (it includes citations even prior to their indexing with MEDLINE)

What is PubMed?

Why PubMed ?

Over 20 million citations for biomedical literature from app. 5500 selected journals from over 70 countries

Source:

- MEDLINE (NLM database)
- Life science journals
- Online books

Fields:

- Medicine
- Nursing
- Dentistry
- Health care system
- Preclinical sciences

Where to start...?

- Internet search/Any search engine
- Guidelines review
- Database search – Medline/PsycINFO
- Reference tracking-references in articles
- Expert contacts

General overview



Thorough search



Refining



More thorough search?

**If you fail to plan,
you plan to fail.**

Ben Franklin

Prepare → Organize → Combine



Prepare

What do we need to know about our topic?

Make a list of all the terms connected with our topic.

Organize

1

Make a list of the words that are critical to your search.

2

Exchange/add some words if needed.

3

Note terms that you don't want to appear.

4

Discard the rest.

Combine

Use Boolean operators to combine our most important terms

AND

Use AND to connect the terms we want to see.

NOT

Use NOT to exclude terms we don't want.

OR

Use OR to include similar terms.

MeSH indexing

- Acronym for “Medical Subject Headings”
- Similar to key words on other systems
- Used for indexing journal articles for MEDLINE
- Arranged in hierarchy, from more general to more specific
- Used by researchers





Tree of
MeSH
database

[All MeSH Categories](#)

[Analytical, Diagnostic and Therapeutic Techniques and Equipment Category](#)

[Therapeutics](#)

Phototherapy

[Color Therapy](#)

[Heliotherapy](#)

[Laser Therapy, Low-Level](#)

[Photochemotherapy](#)

[Hematoporphyrin Photoradiation](#)

[Ultraviolet Therapy](#)

[PUVA Therapy](#) +

[https://pubmed.ncbi.nlm.nih.gov/](#)

[All MeSH Categories](#)

[Diseases Category](#)

[Nervous System Diseases](#)

[Trauma, Nervous System](#)

Craniocerebral Trauma

[Brain Injuries](#)

[Brain Concussion](#) +

[Brain Hemorrhage, Traumatic](#) +

[Brain Injury, Chronic](#)

[Diffuse Axonal Injury](#)

[Epilepsy, Post-Traumatic](#)

[Pneumocephalus](#)

[Shaken Baby Syndrome](#)

[Cerebrospinal Fluid Otorrhea](#)

[Cerebrospinal Fluid Rhinorrhea](#)

[Coma, Post-Head Injury](#)

[Cranial Nerve Injuries](#)

[Abducens Nerve Injury](#)

[Facial Nerve Injuries](#)

[Optic Nerve Injuries](#)

[Head Injuries, Closed](#)

[Brain Concussion](#) +

[Head Injuries, Penetrating](#)

[Intracranial Hemorrhage, Traumatic](#)

[Brain Hemorrhage, Traumatic](#) +

[Hematoma, Epidural, Cranial](#)

[Hematoma, Subdural](#) +

[Subarachnoid Hemorrhage, Traumatic](#)

[Skull Fractures](#)

[Skull Fracture, Basilar](#)

[Skull Fracture, Depressed](#)

MeSH

This will help you
exclude all other
diseases in that
category

This will give you
fewer articles in
your results page!

Keys to Successful Searching

Indexes: Identifying appropriate **indexes** through clinical questions

Components of “well-built clinical questions.”: PICO

- **Patient/problem**
- **Intervention**
- **Comparison intervention**
- **Outcome**

Try to make a search...

Case example

- A 45-year-old man presents with a 10-month history of burning epigastric pain that has not improved with a proton-pump inhibitor. Findings on upper endoscopy are normal, but *Helicobacter pylori* serology is positive.

Treat Helicobacter pylori or not?

- Try to make a search....

Case example

NCBI Resources How To My NCBI Sign In

PubMed.gov US National Library of Medicine National Institutes of Health

PubMed Helicobacter pylori Search

RSS Save search Limits Advanced Help

Display Settings: Summary, 20 per page, Sorted by Recently Added Send to: Filter your results:

Results: 1 to 20 of 30512 << First < Prev Page 1 of 1526 Next > Last >>

All (30512)
[Free Full Text \(8069\)](#)
[Review \(5375\)](#)
[Manage Filters](#)

Also try:

- [helicobacter pylori infection](#)
- [helicobacter pylori eradication](#)
- [helicobacter pylori gastric cancer](#)
- [helicobacter pylori diagnostic](#)
- [helicobacter pylori caga](#)

Titles with your search terms

- [Helicobacter pylori: gastric cancer and beyond. \[Nat Rev Cancer. 2010\]](#)
- [Clinical practice. Helicobacter pylori infection. \[N Engl J Med. 2010\]](#)

[Helicobacter pylori infection in neonatal mice prevents allergic asthma.](#)
1. Ahmad N.
Thorax. 2011 Sep 22. [Epub ahead of print] No abstract available.
PMID: 21940493 [PubMed - as supplied by publisher]
[Related citations](#)

[Clinical value of duodenal biopsies - Beyond the diagnosis of coeliac disease.](#)
2. Walker MM, Talley NJ.
Pathol Res Pract. 2011 Sep 20. [Epub ahead of print]
PMID: 21940106 [PubMed - as supplied by publisher]
[Related citations](#)

[Motility and Chemotaxis in Campylobacter and Helicobacter.](#)
3. Lertsethtakarn P, Ottemann KM, Hendrixson DR.
Annu Rev Microbiol. 2011 Oct 13;65:389-410.
PMID: 21939377 [PubMed - as supplied by publisher]
[Related citations](#)

Components of “well-built clinical questions”

- PICO

1. Patient/problem - “non-ulcer dyspepsia”
2. Intervention - “treatment of *Helicobacter pylori* infection”
3. Comparison intervention - “no treatment”
4. Outcome - “improve symptoms”

Case
example

NCBI Resources How To My NCBI Sign In

PubMed.gov
US National Library of Medicine
National Institutes of Health

PubMed Helicobacter pylori AND non-ulcer dyspepsia Search

RSS Save search Limits Advanced Help

Display Settings: Summary, 20 per page, Sorted by Recently Added Send to: Filter your results:

Results: 1 to 20 of 613 << First < Prev Page 1 of 31 Next > Last >>

1. [Quantitation of *Helicobacter pylori* ureC gene and its comparison with different diagnostic techniques and gastric histopathology.](#)
Shukla SK, Prasad KN, Tripathi A, Ghoshal UC, Krishnani N, Nuzhat H.
J Microbiol Methods. 2011 Aug;86(2):231-7. Epub 2011 May 23.
PMID: 21624400 [PubMed - in process]
[Related citations](#)

2. [Virulence attributes of *Helicobacter pylori* isolates & their association with gastroduodenal disease.](#)
Saxena A, Shukla S, Prasad KN, Ghoshal UC.
Indian J Med Res. 2011 May;133(5):514-20.
PMID: 21623037 [PubMed - in process] [Free PMC Article](#)
[Free full text](#) [Related citations](#)

3. [High correlation of babA \(2\)-positive strains of *Helicobacter pylori* with the presence of gastric cancer.](#)
Talebi Bezmin Abadi A, Taghvaei T, Mohabbati Mobarez A, Vaira G, Vaira D.

Titles with your search terms

[Comparison of *Helicobacter pylori* eradication rate in patients with [Korean J Gastroenterol. 2008]

Eradication of *Helicobacter pylori* for non-ulcer dyspepsia. [Cochrane Database Syst Rev. 2006]

Prevalence of *Helicobacter pylori* infection in maintenance h [Saudi J Kidney Dis Transpl. 2009]

See more...

71 free full-text articles in PubMed Central

Virulence attributes of *Helicobacter pylori* isolates & their association with n [Indian J Med Res. 2011]

Components of “well-built clinical questions”

- PICO

1. Patient/problem - “non-ulcer dyspepsia”
2. Intervention - “treatment of Helicobacter pylori infection”
3. Comparison intervention - “no treatment”
4. Outcome - “improve symptoms”

Case
example

NCBI Resources How To My NCBI Sign In

PubMed.gov PubMed Helicobacter pylori AND non-ulcer dyspepsia AN Search

US National Library of Medicine National Institutes of Health RSS Save search Limits Advanced Help

Display Settings: [x] Summary, Sorted by Recently Added Send to: [x]

Results: 5 Boolean Operator

Filter your results:
All (5)
[Free Full Text \(2\)](#)
[Review \(2\)](#)
[Manage Filters](#)

Find related data
Database: Select
[Find items](#)

Search details
("helicobacter pylori"[MeSH Terms] OR ("helicobacter"[All Fields] AND "pylori"[All Fields])) OR "helicobacter pylori"[All Fields] AND (non-
[Search](#) [See more...](#)

1. [The effect of **Helicobacter pylori** eradication on symptoms and gastric emptying in patients with nonulcer dyspepsia.](#)
Türkay C, Soykan I, Kir M, Ozden A.
Turk J Gastroenterol. 2002 Sep;13(3):146-53.
PMID: 16378296 [PubMed] [Free Article](#)
[Related citations](#)

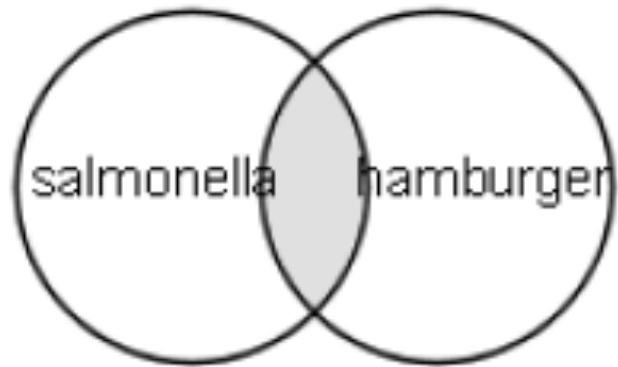
2. [Lack of effect of **Helicobacter pylori** on symptom improvement with a prokinetic medication, cisapride, in patients with non-ulcer dyspepsia.](#)
Gonlachanvit S, Mahachai V, Chaiwatanarat T, Kullavanijaya P.
J Med Assoc Thai. 2005 May;88(5):660-7.
PMID: 16149685 [PubMed - indexed for MEDLINE]
[Related citations](#)

3. [Cure of **Helicobacter pylori** infection does not improve symptoms in non-ulcer dyspepsia patients-a double-blind placebo-controlled study.](#)
Miwa H, Hirai S, Nagahara A, Murai T, Nishira T, Kikuchi S, Takei Y, Watanabe S, Sato N.
Aliment Pharmacol Ther. 2000 Mar;14(3):317-24.

Boolean Operators

AND

- Salmonella AND Hamburger
- Salmonella - 69432
- Hamburger - 2703
- Salmonella AND Hamburger - **14**



Boolean Operators



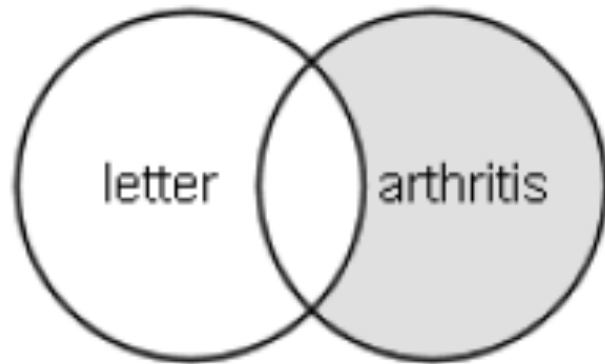
OR

- Football OR Hockey OR Soccer
- Football - 3948
- Hockey - 1466
- Soccer - 3137
- Total - 7538**

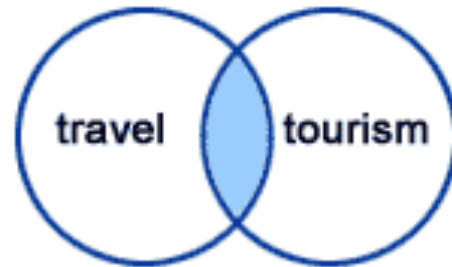
Boolean Operators

NOT

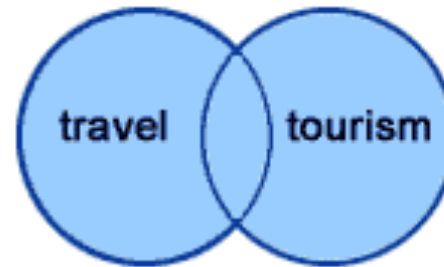
- Arthritis NOT Letter
- Arthritis - 185375
- Letter - 686049
- Arthritis “excluding” letter - **176352**



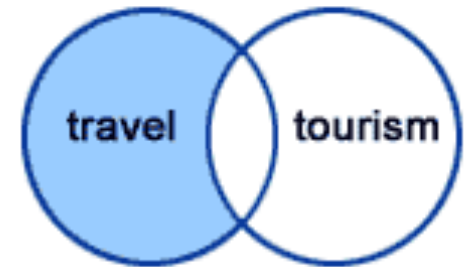
Boolean Operators



travel **AND** *tourism*



travel **OR** *tourism*



travel **NOT** *tourism*



(travel **OR** *tourism)* **AND** *Web*



(travel **AND** *tourism)* **NOT** *tourists*



PubMed

PubMed comprises more than 22 million citations for biomedical literature from MEDLINE, life science journals, and online books. Citations may include links to full-text content from PubMed Central and publisher web sites.

Using PubMed

[PubMed Quick Start Guide](#)[Full Text Articles](#)[PubMed FAQs](#)[PubMed Tutorials](#)[New and Noteworthy](#) 

PubMed Tools

[PubMed Mobile](#)[Single Citation Matcher](#)[Batch Citation Matcher](#)[Clinical Queries](#)[Topic-Specific Queries](#)

More Resources

[MeSH Database](#)[Journals in NCBI Databases](#)[Clinical Trials](#)[E-Utilities](#)[LinkOut](#)

Critical Appraisal Table – Key Elements

Reference or ID number: the table must include a unique identifier for ease in finding the record being appraised.

Study Design: this helps with determining the strength of evidence of the data.


Participants: How many participants were in the study?

Characteristics of the problem within the population

Intervention outcomes.

Include or exclude the study? based on what you find

Reference	Study Design	Population		Intervention Outcomes Discussion	I or E
		# of Study Participants	Charac-teristics		
Bertani et al, 2015	Cross-sectional Study	61	Brazilian pregnant women, 25 of whom smoked	Alternative forms of tobacco consumption including e-cigarettes are discussed, and it is recommended that additional studies are needed.	
Kahr et al, 2015	Focus Groups	11 focus groups with 87 participants	Pregnant women, Houston, Texas	Clinicians should advise against e-cigarettes as they are not considered safe nor effective in smoking cessation.	
Suter et al, 2014	Review Article	14 articles	Table discusses effects of utero nicotine exposure on offspring	Authors conclude that "no amount of nicotine is known to be safe during pregnancy."	
England et al, 2014	Mailed survey	1024 ACOG Members/ 252 eligible	American College of Obstetrics & Gynecology	Ob/Gyns are not consistently screening pregnant patients, and many are not knowledgeable about the harms of e-cigarettes.	
Spindel et al, 2016	Research Article (NIH Extramural Funding)	n/a	n/a	In a review of the literature, authors found that "data strongly imply that at least 50% of vapers will continue to vape while pregnant despite best efforts at cessation (citing two articles), and that nicotine is addictive (citing one article)	



Key Elements of High Quality Articles

- **Peer Reviewed Journal:** This is a process where experts in a scholarly discipline review the research of an author or authors to ensure that the article meets standards for publication. The criteria includes: quality, significance, methodology, and importance.
- **Currency:** Locating the most current five or ten years of information is not a gold standard. There are several factors that determine how far back in time your search should run.
- Clearly **recognized research question or problem:** The introduction or background should include what is known, what is unknown and what is the author's aim or hypothesis.
- **Study design:** Revisit the PUBLIC HEALTH EVIDENCE-BASED PYRAMID to review different types of study designs.
- **Times Cited:** This is an indication that something important is going on with the article, but one should not assume that the article is necessarily good.

Summarizing the Literature Review

Introduction: Gives a quick idea of the topic of the literature review, such as the central theme or organizational pattern.

Body: Contains your discussion of sources and is organized either chronologically, thematically, or methodologically

Conclusions/Recommendations: Discuss what you have drawn from reviewing literature so far. Where might the discussion proceed?

For more info:

<https://writingcenter.unc.edu/tips-and-tools/literature-reviews/>



Thank You!